10 BT Adapter Cards
Installation Manual

Racal
InterLan

10BT Adapter Cards Installation Manual

Racal InterLan

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Rev AA

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PREFACE

This manual describes Racal InterLan's twisted pair data-link adapter cards for IBM PCs, PC ATs, PC/XTs, PS/2s, Apple Macintosh II, and compatible computers. After reading this manual, you will be able to:

- Change the adapter card's configuration settings, if necessary
- Install the card in your PC
- Connect the card to your unshielded twisted pair network
- Test the card using Racal InterLan's diagnostic programs and interpret system error messages

Who Should Read This Manual

You should read this manual if you are going to install a twisted pair adapter card in a PC and connect the card to an unshielded twisted pair local area network. Knowledge of how to install adapter cards in PCs and familiarity with the hardware components of twisted pair local area networks are helpful but not necessary.

Related Reading

To learn more about Ethernet, refer to the following document:

- *Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications* (ANSI/IEEE Standard 802.3-1985), The Institute of Electrical and Electronics Engineers, Inc., 345 East 47th St., New York, NY 10017, 1985

To learn more about 10BT local area networks, refer to the following document:

- Draft Supplement to IEEE Std. 802.3, *Systems Considerations for Multi Segment 10MB/S Baseband Networks (Section 13) and Medium Attachment Unit and Baseband Medium Specification, Type 10BASET (Section 14)* (P802.3I/D10, January 16, 1990), The Institute of Electrical and Electronics Engineers, Inc., 345 East 47th St., New York, NY 10017

  Note: *The above document is an unapproved draft published for comment only.*

To learn more about IBM PC, IBM PC AT, IBM PC/XT, and IBM PS/2 computers, refer to the following documents:

- *IBM PC Technical Reference Manual*, IBM Corp., Order Number: 6025005
- *IBM PC AT Technical Reference Manual*, IBM Corp., Order Number: 1502243
- *Installation and Setup, Personal Computer AT*, IBM Corp., Order Number: 6183217

- *IBM Personal System/2 Model Quick Reference* for your PS/2 model

To learn more about Macintosh II computers, refer to the following documents:

- *Designing Cards and Drivers for Macintosh II and Macintosh SE*, 1987, Apple Computer, Inc.
- *NuBus System Architecture Specification*, 1985, Texas Instruments P/N 2536702-001
- *NuBus–A Simple 32-Bit Backplane Bus, p1196 Specification*, Draft 2.0, December 15, 1986, IEEE

How This Manual Is Organized

This manual is organized as follows:

Chapter 1 is an introduction to Racal InterLan's 10BASET adapter cards.

Chapter 2 describes each adapter card's configuration, the criteria for changing it, and how to change it.

Chapter 3 describes installing the adapter card in your PC.

Chapter 4 describes connecting the card to an unshielded twisted pair local area network.

Chapter 5 contains instructions for using your particular adapter card's diagnostic program (or, in the case of the MacConnect 10BT, interpret system error messages) to verify that the card is functioning properly.

Service and Support

Information about service and support for Racal InterLan products is contained in the Support Services section at the end of this manual.

Conventions

In this manual, the following terms are used:

- **Card** is synonymous with expansion board, expansion card, and adapter.
- **Network** refers to unshielded twisted pair local area networks meeting the IEEE 802.3 10BASET specifications.
- **PC** refers to any one of the following: IBM PC, IBM PC/XT, IBM PC AT, IBM PS/2, Apple Macintosh II, Apple Macintosh II, and other true compatible computers.
- **Macintosh II** refers to Macintosh II, Macintosh IIcx, Macintosh IIci computers.

If You Have Comments about This Manual

The Technical Publications Department would like to receive any comments, corrections, or suggestions you have concerning this manual. Send correspondence to the following address:

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Chapter 1

Introduction

Adapter Cards for PC, PC AT, and PC/XT Computers

Adapter Cards for PS/2 Computers

Adapter Cards for Macintosh II Computers

INTRODUCTION

Racal InterLan provides an extensive line of twisted pair data-link adapter cards for use with most industry-standard PC architectures.

All of Racal InterLan's adapter cards are designed in accordance with the IEEE 802.3 standard and implement this standard over 10BASET local area networks.

This section provides a brief description of the data-link adapter cards available from Racal InterLan for each type of personal computer.

Adapter Cards for PC, PC AT, and PC/XT Computers

This section describes Racal InterLan's twisted pair adapter cards for use with IBM PC, PC AT, and PC/XT computers and compatibles.

NI5210-10BT

The Racal InterLan NI5210-10BT Ethernet controller is an 8-bit, inexpensive, full-size network communication expansion card. The NI5210-10BT:

- Is mechanically and architecturally compatible with IBM's specifications for PC, PC AT, or PC/XT bus architectures
- Uses one of the PC, PC AT, or PC/XT's full-size expansion slots

NI6510-10BT

The Racal InterLan NI6510-10BT Ethernet controller is a 16-bit, high-performance, inexpensive expansion card for PC AT buses adhering to the Industry Standard Architecture (ISA), a de-facto industry standard architecture evolved from the original IBM PC system architecture.

The NI6510-10BT:

- Is mechanically and architecturally compatible with the specifications for the ISA
- Uses one of the PC AT's 16-bit expansion slots

Adapter Cards for PS/2 Computers

This section describes Racal InterLan's twisted pair adapter cards for use with PS/2 computers and the Micro Channel Architecture.

NI9210-10BT

The Racal InterLan NI9210-10BT is a network expansion card that can be used in any IBM Personal System/2 (PS/2) computer that uses the Micro Channel Architecture (MCA).

The NI9210-10BT:

- Is mechanically and architecturally compatible with IBM's specifications for the Micro Channel bus architecture
- Uses surface mount technology to increase the card's reliability
- Uses one of the PS/2's 16-bit expansion slots

Adapter Cards for Macintosh II Computers

This section describes Racal InterLan's twisted pair adapter cards for use in Macintosh II computers.

MacConnect 10BT

Racal InterLan's MacConnect 10BT provides a connection between your Macintosh II computer and an unshielded twisted pair local area network.

The MacConnect 10BT:

- Supports all devices using AppleTalk communication software. This means that all programs that work on AppleTalk will work across the network with MacConnect 10BT.
- Supports other communication software, such as NCSA Telnet Version 2.2, and other software application programs that conform to Apple's EtherTalk specifications.

Chapter 2

The 10BT Adapter Card's Configuration

PC, PC AT, or PC/XT Cards

PS/2 Cards

Macintosh II Cards

THE 10BT ADAPTER CARD'S CONFIGURATION

This chapter contains configuration information for each type of 10BT card. *Configuration* is the way the card's hardware components are set to interact with your PC and other cards installed in your PC. Each card requires a specific configuration that gives it a unique identity within the operating system and, as a result, lets the installed card:

- Avoid conflicts with other installed cards
- Avoid conflicts with software applications
- Transmit and receive data over the network

There are several ways to configure your card.

- Cards for PC, PC AT, or PC/XT or compatible computers use *jumpers*, which are set by connecting specific pins with a plastic jumper block. This completes a specific electrical circuit that allows the card to function in a particular way. In this manual's configuration illustrations, jumper block positions are shown as shaded areas over two jumper pins.

- Cards for PS/2 computers have a menu-driven program to change the configuration.

- Cards for Macintosh II computers require no configuration by the user.

If your card has a preset configuration, it may not require any change in configuration. Read the section specific to your card to determine:

- If it has a preset configuration

- When to change the configuration
- The steps to follow if the configuration needs to be changed

PC, PC AT, or PC/XT Cards

This section describes the configuration procedures for the following twisted pair adapter cards:

- NI5210-10BT
- NI6510-10BT

NI5210-10BT

This section describes:

- The NI5210-10BT's preset configuration
- The criteria for changing the preset configuration
- Restrictions on changing the configuration
- The steps to follow for changing the card's configuration

Preset Configuration

Your card's preset configuration is the way the jumpers are set when shipped by Racal InterLan. Racal InterLan assembles and ships the NI5210-10BT with the following preset configuration:

- I/O Base Address is 360 (hex)
- Memory Base Address is C0000 (hex)
- Interrupt Request Level is 2 (IRQ2)

- The NI5210-10BT-8 is configured for 8 KB of memory; the NI5210-10BT-16 is configured for 16 KB of memory

When to Change the Configuration

If any of the following conditions are true, you must change the configuration of your NI5210-10BT.

- Your NI5210-10BT's I/O base address, memory base address, or interrupt request level matches that of another adapter card in your PC.
- The software you are planning to use with the NI5210-10BT has specific hardware configuration requirements that are different from the preset configuration.
- You have increased the NI5210-10BT-8's memory to 16 KB or you have installed a Boot PROM chip on the card.

Restrictions

The following restrictions apply when you are determining a usable configuration for the NI5210-10BT:

- Before installing the NI5210-10BT-8 or NI5210-10BT-16, you **must** determine whether the software applications you intend to use with the card are configured specifically for 8 or 16 KB of built-in memory.
- Do not set a memory base address of E0000 (hex) or higher on the NI5210-10BT if you are installing the card in an IBM PC AT or compatible, since this addressable memory space is reserved for use by the AT's CPU.

- If you plan to install or are using an Enhanced Graphics Adapter (EGA) card in your PC, you **must** change the NI5210-10BT's preset memory base address. The NI5210-10BT's preset memory base address and the EGA card's preset memory base address are identical, and therefore conflict. Select any memory base address, other than the preset C0000 (hex), from Table 2-2.

- If your PC is an IBM PC/XT or compatible, do not set IRQ5. IRQ5 is the interrupt request level used by your PC's hard disk. If you set IRQ5, you may lose data stored on your hard disk when you use the NI5210-10BT.

- Do not set jumper W1 (located in the upper right corner of the card) or jumper W8 (located to the the right of the interrupt request level jumpers). Setting either of these jumpers could cause transmission problems.

How to Change the Configuration

The NI5210-10BT has four sets of configuration jumpers as follows:

- I/O Base Address
- Memory Base Address
- Interrupt Request Level
- Extended Memory

Figure 2-1 shows the locations of these jumpers in relation to some of the card's major components.

The I/O base address, memory base address, and extended memory jumpers consist of combinations of three-pin jumpers. A plastic jumper block connects two of the three pins–the middle pin and a pin at one end–to enable your selected setting. To change the setting, move the plastic jumper block so that it connects the middle pin of the jumper to the pin at the other end.

The interrupt request level jumpers consist of combinations of two-pin jumpers. To enable your selected setting, place the plastic jumper block over both pins.

(You may need a small pair of needle-nosed pliers to remove and reposition a jumper block.)

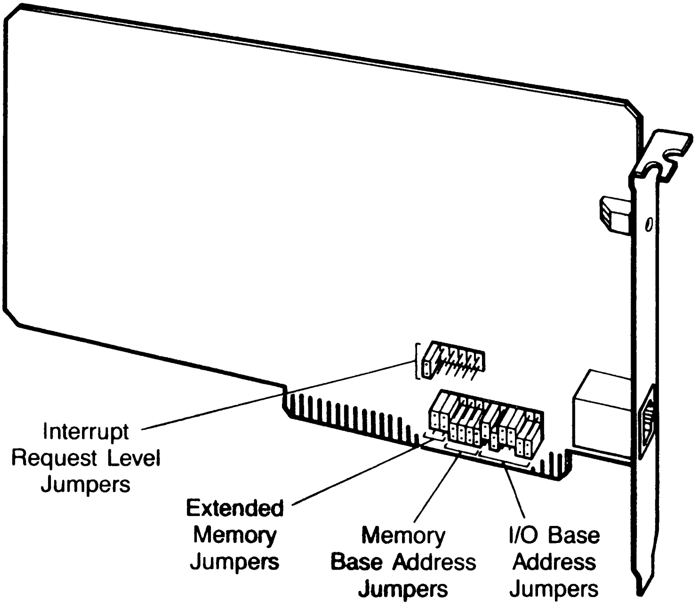


Figure 2-1. Locations of the NI5210-10BT Configuration Jumpers

Changing the I/O Base Address

The I/O base address jumpers are located in the bottom right corner of the card. These jumpers are labeled 8, 7, 6, 5, 4, and 3. They are also marked with brackets and labeled IOBA.

The preset address, 360 (hex), is shown in Figure 2-2.

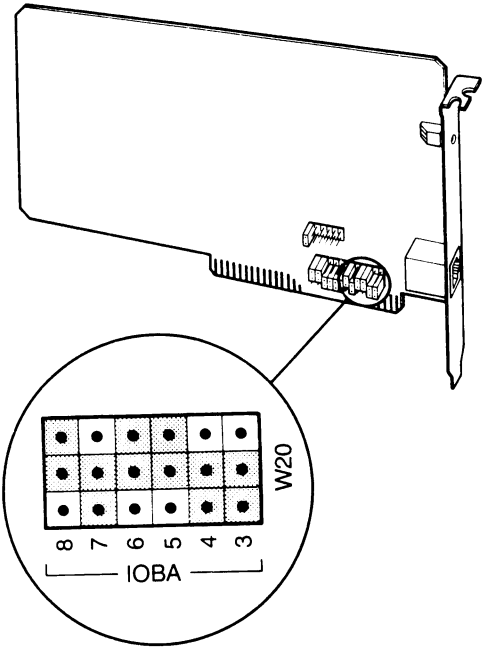


Figure 2-2. Jumper Settings for the Preset I/O Base Address: 360 (hex)

To change the I/O base address:

1. Select an address from Table 2-1, which lists the jumper settings for the valid I/O base addresses that you can set on the NI5210-10BT. Note that the A and B settings are labeled next to the jumpers on the card.
2. Position the jumper blocks on the pins so that they correspond to the setting shown for that address in the table.

Table 2-1. Jumper Settings for Valid NI5210-10BT I/O Base Addresses

Address (hex)	**I/O Base Address Jumper Settings**					
	8	**7**	**6**	**5**	**4**	**3**
200	A	A	A	A	A	A
208	A	A	A	A	A	B
210	A	A	A	A	B	A
218	A	A	A	A	B	B
220	A	A	A	B	A	A
228	A	A	A	B	A	B
230	A	A	A	B	B	A
238	A	A	A	B	B	B
240	A	A	B	A	A	A
248	A	A	B	A	A	B
250	A	A	B	A	B	A
258	A	A	B	A	B	B
260	A	A	B	B	A	A
268	A	A	B	B	A	B
270	A	A	B	B	B	A
278	A	A	B	B	B	B
* 280	A	B	A	A	A	A
288	A	B	A	A	A	B
290	A	B	A	A	B	A

(continued)

Table 2-1. Jumper Settings for Valid NI5210-10BT I/O Base Addresses *(continued)*

Address (hex)	I/O Base Address Jumper Settings					
	8	**7**	**6**	**5**	**4**	**3**
298	A	B	A	A	B	B
2A0	A	B	A	B	A	A
2A8	A	B	A	B	A	B
2B0	A	B	A	B	B	A
2B8	A	B	A	B	B	B
2C0	A	B	B	A	A	A
2C8	A	B	B	A	A	B
2D0	A	B	B	A	B	A
2D8	A	B	B	A	B	B
2E0	A	B	B	B	A	A
2E8	A	B	B	B	A	B
2F0	A	B	B	B	B	A
2F8	A	B	B	B	B	B
300	B	A	A	A	A	A
308	B	A	A	A	A	B
310	B	A	A	A	B	A
318	B	A	A	A	B	B
320	B	A	A	B	A	A
328	B	A	A	B	A	B

(continued)

Table 2-1. Jumper Settings for Valid NI5210-10BT I/O Base Addresses *(continued)*

Address (hex)	I/O Base Address Jumper Settings					
	8	7	6	5	4	3
330	B	A	A	B	B	A
338	B	A	A	B	B	B
340	B	A	B	A	A	A
348	B	A	B	A	A	B
350	B	A	B	A	B	A
358	B	A	B	A	B	B
360	B	A	B	B	A	A
368	B	A	B	B	A	B
370	B	A	B	B	B	A
378	B	A	B	B	B	B
380	B	B	A	A	A	A
388	B	B	A	A	A	B
390	B	B	A	A	B	A
398	B	B	A	A	B	B
3A0	B	B	A	B	A	A
3A8	B	B	A	B	A	B
3B0	B	B	A	B	B	A
3B8	B	B	A	B	B	B
3C0	B	B	B	A	A	A

(continued)

Table 2-1. Jumper Settings for Valid NI5210-10BT I/O Base Addresses *(continued)*

Address (hex)	I/O Base Address Jumper Settings					
	8	7	6	5	4	3
3C8	B	B	B	A	A	B
3D0	B	B	B	A	B	A
3D8	B	B	B	A	B	B
3E0	B	B	B	B	A	A
3E8	B	B	B	B	A	B
3F0	B	B	B	B	B	A
3F8	B	B	B	B	B	B

Changing the Memory Base Address

The memory base address jumpers are immediately to the left of the I/O base address jumpers and are labeled 17, 16, 15, and 14. They are also marked with brackets and labeled MBA.

The jumper settings for the preset memory base address, C0000 (hex), are shown in Figure 2-3.

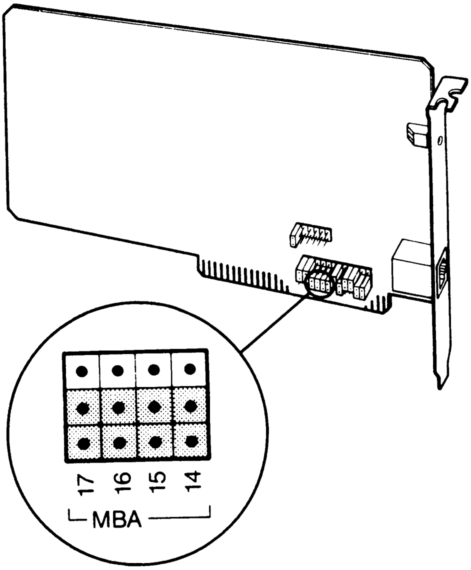


Figure 2-3. Jumper Settings for the Preset Memory Base Address: C0000 (hex)

To change the memory base address:

1. Select an address from Table 2-2, which lists the jumper settings for the valid memory base addresses that you can set on the NI5210-10BT. Note that the A and B settings are labeled next to the jumpers on the card.

2. Position the jumper blocks on the pins so that they correspond to the setting shown for that address in the table.

Table 2-2. Jumper Settings for Valid NI5210-10BT Memory Base Addresses

Address (hex)	Memory Base Address Jumper Settings			
	17	16	15	14
C0000	A	A	A	A
C4000	A	A	A	B
C8000	A	A	B	A
CC000	A	A	B	B
D0000	A	B	A	A
D4000	A	B	A	B
D8000	A	B	B	A
DC000	A	B	B	B
E0000	B	A	A	A
E4000	B	A	A	B
E8000	B	A	B	A
EC000	B	A	B	B

Changing the Interrupt Request Level

The interrupt request (IRQ) level jumpers are located just above the memory base address jumpers and are labeled 2, 3, 4, 5, 6, and 7 from left to right. The numbers correspond to the IRQ level that each jumper sets. For example: the card's preset interrupt request level is IRQ2. To change this to IRQ7, move the jumper block from position 2 to position 7, as shown in Figure 2-4.

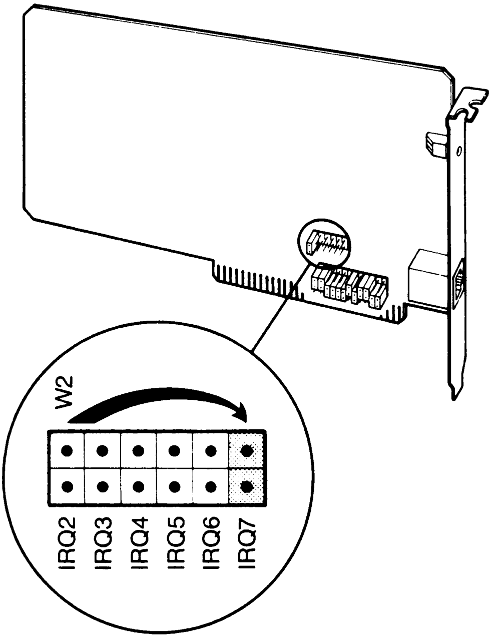


Figure 2-4. Changing the Preset Interrupt Request Level (IRQ2) to Level 7 (IRQ7)

Extended Memory Jumpers

The extended memory jumpers, marked XME and XRE, are located just to the left of the memory base address jumpers. You must alter the settings of the extended memory socket jumpers **only** under one of the following conditions:

- When you change the NI5210-10BT-8's built-in memory from 8 KB to 16 KB by installing one 8-KB RAM device in the extended memory socket (socket U15)

- When you install a Boot PROM device (not available from Racal InterLan) in the NI5210-10BT-8's extended memory socket

The NI5210-10BT-16 comes with the XME and XRE jumpers preset for 16 KB of RAM; you do not have to change the settings of these jumpers unless you change the amount of RAM on the card to 8 KB, or replace an 8-KB RAM chip with a Boot PROM chip.

Racal InterLan ships the NI5210-10BT-8 with the jumpers preset for 8 KB of built-in memory, as shown in Figure 2-5.

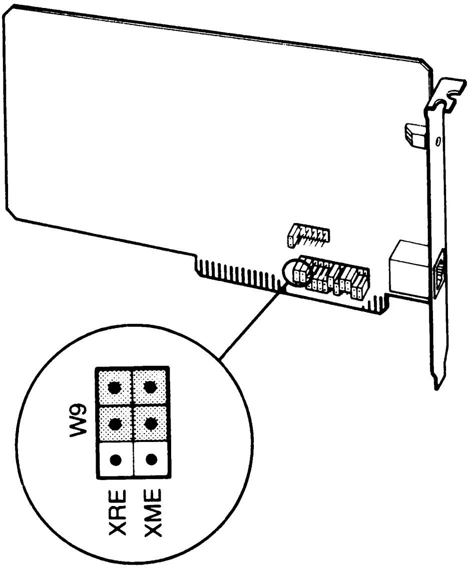


Figure 2-5. Preset Jumper Settings for the Extended Memory Jumpers

To change the NI5210-10BT-8's configuration for the expanded memory or Boot PROM device, position the jumper blocks for the extended memory socket jumpers as indicated in Table 2-3.

Table 2-3. Extended Memory Jumper Settings

State of NI5210-10BT	Extended Memory Jumper Settings	
	XME	XRE
8-KB RAM	B	-
16-KB RAM	A	A
Optional Boot PROM Device	A	B

NI6510-10BT

This section describes:

- The NI6510-10BT's preset configuration
- The criteria for changing the preset configuration
- Restrictions on changing the configuration
- The steps to follow for changing the card's configuration

The Preset Configuration

Your card's preset configuration is the way the jumpers are set when shipped by Racal InterLan. Racal InterLan assembles and ships the NI6510-10BT with the following preset configuration:

- I/O Base Address is 360 (hex).
- Boot PROM is disabled.
- Interrupt Request Level is 9 (IRQ9).
- Direct Memory Access is set to channel 3 (DMA3).

When to Change the Configuration

If any of the following conditions are true, you must change the configuration of your NI6510-10BT:

- The I/O base address, IRQ level, or DMA channel matches that of another board already installed in your PC. Neither card can operate correctly if any of the settings are the same.

- The software you are planning to use with the NI6510-10BT has specific hardware configuration requirements that are different from the preset configuration.

- You add a Boot PROM.

Restrictions

The following restrictions apply when you are determining a usable configuration for the NI6510-10BT.

- The NI6510-10BT only operates correctly with the settings listed in this section. If these settings are all being used, you must change the configuration of another card.

- The NI6510-10BT's I/O base address must be at least 10 (hex) below or 2 (hex) above the I/O base address of any other card in your PC AT.

- If no Boot PROM is to be installed, the jumper block must be in the NO BOOT position.

- Do not set jumper W18 (located in the top right corner of the card). Setting this jumper could cause transmission problems.

How to Change the Configuration

The NI6510-10BT has four sets of configuration jumpers, as follows:

- I/O Base Address
- Boot PROM Base Address
- Interrupt Request Level
- DMA Channel

Figure 2-1 shows the locations of these jumpers in relation to some of the card's major components.

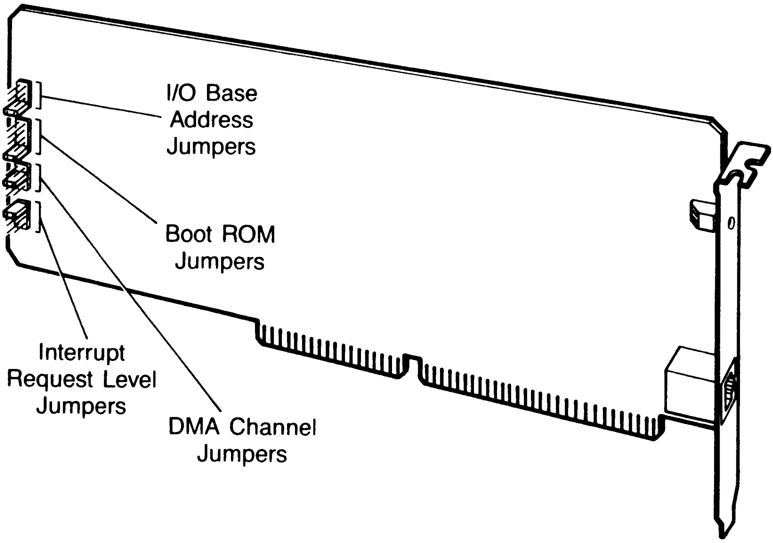


Figure 2-6. Locations of the NI6510-10BT Configuration Jumpers

Jumpers on the NI6510-10BT consist of combinations of two-pin jumpers. To enable your selected setting, place the plastic jumper block over both pins.

(You may need a small pair of needle-nosed pliers to remove and reposition a jumper block.)

The following sections tell you how to change jumper settings to enable new configurations on the NI6510-10BT.

Changing the I/O Base Address

To change the NI6510-10BT's I/O base address:

1. Select a new address from the list below that does not conflict with the I/O base address of another board, and that meets any software requirements.
    - 300 (hex)
    - 320 (hex)
    - 340 (hex)
2. Position the jumper block on the pins to correspond to the new address (see Figure 2-7).

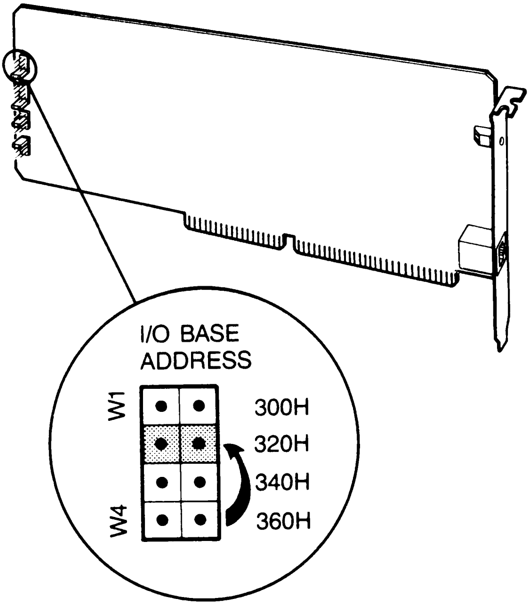


Figure 2-7. **Changing the I/O Base Address Jumper Setting from 360 (hex) to 320 (hex)**

Changing the Boot PROM Base Address

To change the NI6510-UTP's Boot PROM setting:

1. Select a new address from the list below that does not conflict with the Boot PROM base address of another board, and that meets the Boot PROM device requirements, if any.
    - D0000 (hex)
    - D4000 (hex)
    - D8000 (hex)
    - DC000 (hex)
2. Position the jumper block on the pins to correspond to the new address (see Figure 2-8).

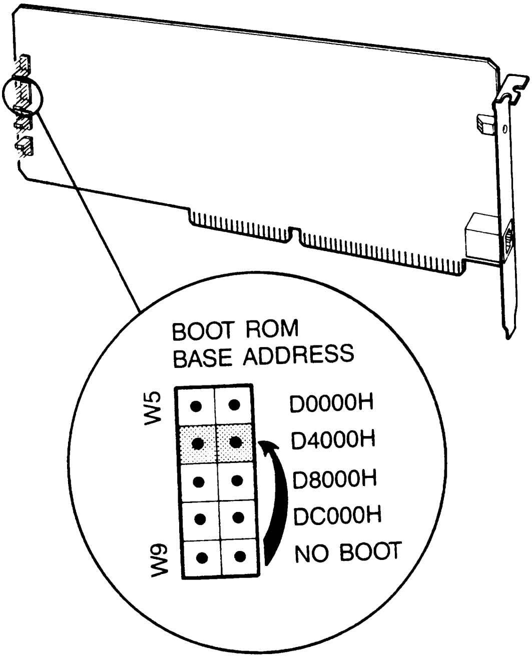


Figure 2-8. Changing the Boot PROM Jumper Setting from "No Boot PROM" to D4000 (hex)

Changing the Interrupt Request Level

To change the NI6510-UTP's interrupt request level:

1. Select a new level from the list below that does not duplicate the IRQ level of another board, and that meets software requirements, if any.

    - IRQ12
    - IRQ15
    - IRQ5

2. Position the jumper block on the pins to correspond to the new setting (see Figure 2-9).

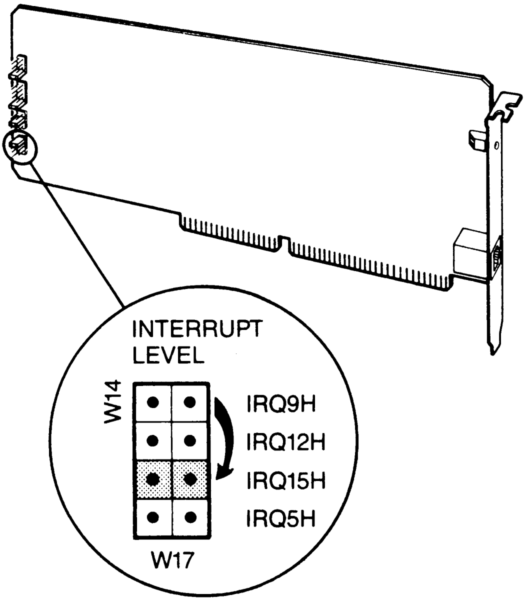


Figure 2-9. Changing the Interrupt Request Level Jumper Setting from IRQ9 to IRQ15

Changing the DMA Channel

To change the NI6510-UTP's DMA channel, follow these steps:

1. Select a new setting from the list below that does not conflict the DMA channel of another board, and that meets any software requirements.

    - DMA0
    - DMA5
    - DMA6

2. Position the jumper blocks on the pins to correspond to the new channel (see Figure 2-10).

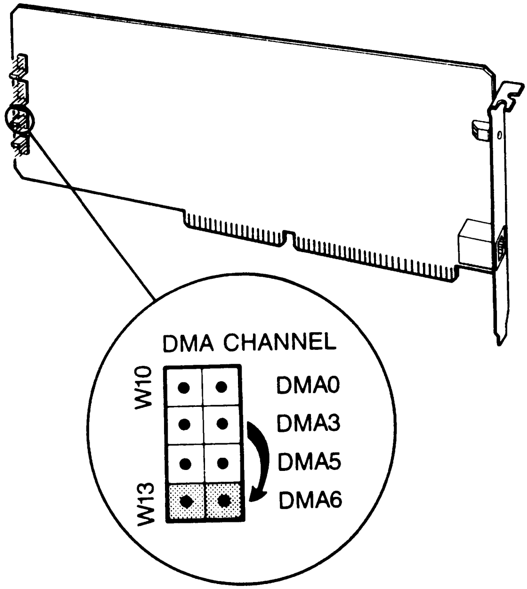


Figure 2-10. Changing the DMA Channel Jumper Setting from DMA3 to DMA6

PS/2 Cards

The following section describes the configuration procedure for the NI9210-10BT adapter card.

NI9210-10BT

This section describes the configuration procedure you must follow for your PS/2 to recognize the NI9210-10BT **after** you have installed it.

Note: *Before you configure the NI9210-10BT, it* **must** *be installed in your PS/2 (see the section titled "Installing a Card in a PS/2" in Chapter 3).*

Once you have installed the card, configure it with the following steps. Each step is described in detail in the remainder of this section.

1. Copy the Adapter Description File (ADF) from the IBM Reference Diskette to a backup diskette.
2. Run the automatic configuration program from the backup diskette to assign the default configuration.
3. Review the configuration.
4. Change the configuration, if necessary.
5. Set a Boot PROM address, if you have installed a Boot PROM device.

Copying the Adapter Description File

The IBM Reference Diskette, included with the card, contains an executable file that automatically copies the card's ADF and the diagnostic program onto a backup of the IBM Reference Diskette.

To configure the NI9210-10BT, you **must** have a backup copy of the IBM Reference Diskette onto which the NI9210-10BT's Adapter Description File (ADF) has been copied. The IBM Reference Diskette is write-protected and does not allow you to change the assigned configuration.

To run the executable file:

1. Insert the IBM Reference Diskette into your PS/2's disk drive (include a drive specification, if necessary) and type **Install.**
2. The IBM copyright notice appears.
3. Press Enter and follow the program's prompts as it executes.

Note: *If you have other adapters installed, make sure to copy their ADFs onto the backup reference diskette.*

Running the Configuration Program

When you run the automatic configuration program, it assigns the NI9210-10BT a set of default settings for its configuration parameters, as follows:

- I/O Base Address is 300 (hex).
- Boot PROM is disabled.
- Memory Base Address is 0C0000 (hex).
- Interrupt Request Level is 3.
- Bus Master is disabled.
- Memory size is 16K.

To run the configuration program, follow these steps:

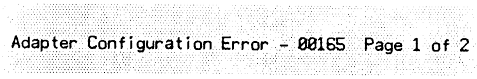
1. Turn your PS/2 **off.**
2. Insert the **backup copy** of your reference diskette into your PS/2's disk drive.

3. Turn your PS/2 **on**. The IBM copyright notice appears.

4. Press Enter.

Note: *It is important that you insert the diskette prior to turning on the system.*

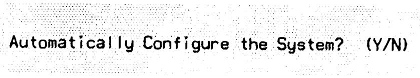
The following error message appears at the top of the screen:



```
Adapter Configuration Error - 00165  Page 1 of 2
```

Disregard this error message. It is generated because the system has detected an unrecognized option adapter—in this case, the NI9210-10BT.

5. If you are using a PS/2 Model 80, press the Page Down key to read the second screen of the error message. (The PS/2 Model 50 and 60 versions of the reference diskette condense this information onto one page.) The last line of both versions reads as follows:



```
Automatically Configure the System?  (Y/N)
```

Press **Y** to start the automatic configuration program.

Press **N** if you want to configure your card manually.

Note: *Racal InterLan recommends running the automatic configuration program.*

Two status messages appear on your screen as the automatic configuration program executes.

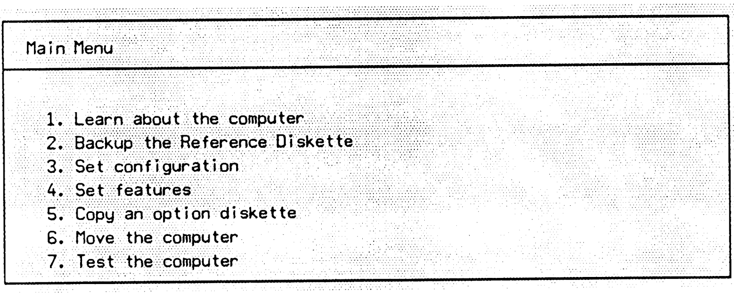
6. Press Enter, as instructed by the second message, to restart your computer. The IBM copyright notice appears.

7. Press Enter again to access the Main menu.

The next section describes how to view the configuration assigned to the NI9210-10BT.

Reviewing the Configuration

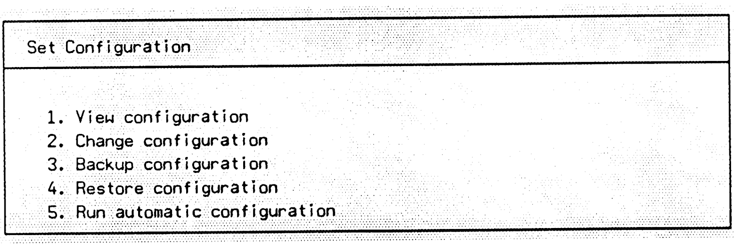
To review the NI9210-10BT's configuration, first select **Set configuration** (option 3) from the Main menu shown in Figure 2-11.



```
Main Menu

  1. Learn about the computer
  2. Backup the Reference Diskette
  3. Set configuration
  4. Set features
  5. Copy an option diskette
  6. Move the computer
  7. Test the computer
```

Figure 2-11. The Adapter Description File's Main Menu

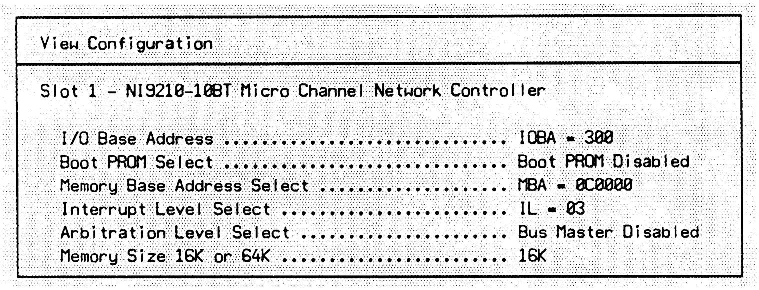
The Set Configuration menu, shown in Figure 2-12, appears. Select **View configuration** (option 1).



```
Set Configuration

  1. View configuration
  2. Change configuration
  3. Backup configuration
  4. Restore configuration
  5. Run automatic configuration
```

Figure 2-12. The Set Configuration Menu

The View Configuration menu appears (see Figure 2-13), showing the NI9210-10BT's default configuration.



```
View Configuration

Slot 1 - NI9210-10BT Micro Channel Network Controller

  I/O Base Address ............................ IOBA = 300
  Boot PROM Select ............................ Boot PROM Disabled
  Memory Base Address Select .................. MBA = 0C0000
  Interrupt Level Select ...................... IL = 03
  Arbitration Level Select .................... Bus Master Disabled
  Memory Size 16K or 64K ...................... 16K
```

Figure 2-13. The View Configuration Screen

Each of the NI9210-10BT's configuration parameters is briefly described in the following list.

I/O Base Address — This address identifies the NI9210-10BT within your PS/2's I/O address space. Valid addresses are in the range 0300 (hex) to 1FE0 (hex), in increments of 20 (hex). No two adapter cards can have the same I/O base address. If you assign the NI9210-10BT an I/O base address used by another device, you receive an error message. This means you have to change the address of either the NI9210-10BT or the other device.

Boot PROM — The Boot PROM address is the location of the Boot PROM chip in your PS/2's ROM expansion area. A Boot PROM address should only be set after a Boot PROM chip is installed; otherwise, this parameter's setting must be "Boot PROM Disabled". Valid addresses are in the range 0C0000 (hex) to 0DFFFF (hex). No other device can have the same address as the Boot PROM chip.

Memory Base Address — The memory base address marks the start of the NI9210-10BT's RAM in the memory address space of your PS/2. The memory base addresses supplied are in the range 0C0000 (hex) to 0DFFFF (hex).

No other device can have the same memory base address as the NI9210-10BT.

Interrupt Level — This setting determines the priority at which interrupts from the card are processed by your PS/2's CPU. Only the following IRQ levels are supported on the NI9210-10BT: 3, 9, 10, and 11.

Arbitration Level — This setting determines the priority at which competing devices are granted control of the Micro Channel bus. Only the following arbitration levels are supported on the NI9210-10BT: 0, 1, 2, and 3. If you choose to operate the NI9210-10BT as a bus slave, the setting of this parameter must be "Bus Master Disabled". No other adapter card can have the same arbitration level as the NI9210-10BT.

Memory Size — This setting reflects how much RAM is resident on the card. The NI9210-10BT is available with 16 KB.

When to Change the Configuration

In most cases, you do not need to change these assigned default settings, but you must if either of the following conditions are true:

- The software you are planning to use with the NI9210-10BT has specific hardware configuration requirements that are different from the default configuration assigned to the card by the automatic configuration file. Check your software's documentation to verify whether it requires a certain hardware configuration.
- You have installed a Boot PROM chip on the card.

Changing the NI9210-10BT's Configuration

Follow these steps to change the NI9210-10BT's configuration:

1. Select **Set configuration** (option 3) from the backup reference diskette's Main menu (see Figure 2-11).
2. Select the **Change configuration** option from the Set Configuration menu (see Figure 2-12).
3. Move the cursor into the section that lists the NI9210-10BT's configuration. Then move the cursor to the configuration parameter you want to change.
4. Use the F5 key to decrease the setting; use the F6 key to increase the setting.

If You Have Installed a Boot PROM

Before your PS/2 can gain access to the NI9210-10BT's Boot PROM chip, you must specify the chip's address. To do this, select the **Change configuration** option from the Set Configuration menu, as described in Steps 1 and 2 above.

Move the cursor to the line "Boot PROM Disabled" in the section that lists the NI9210-10BT's configuration. Use the F5 (previous setting) and F6 (next setting) keys to select a Boot PROM address.

After setting an address, check the card's configuration to make sure the enabled address does not conflict with some other device's address. A conflicting address is marked with an asterisk.

If you are satisfied that the NI9210-10BT is correctly configured, go to Chapter 4.

Macintosh II Cards

The MacConnect 10BT adapter card requires no configuration by the user.

Go to Chapter 3.

Chapter 3

Installing a Card in the PC

Installing a Card in a PC, PC AT, or PC/XT

Installing a Card in a PS/2

Installing a Card in a Macintosh II

INSTALLING A CARD IN THE PC

This chapter describes installing your 10BT adapter card in a PC, PC AT, PC/XT, PS/2, or Macintosh II computer. To install a card in one of these computers, you need to:

- Gain access to your PC's expansion slots
- Secure the card in an expansion slot

You also need a medium-size flat-blade screwdriver and a small Phillips-head screwdriver.

This chapter is divided into three sections, describing:

- How to install a 10BT card in a PC, PC AT, or PC/XT computer

- How to install a 10BT card in a PS/2 computer

- How to install a 10BT card in a Macintosh II computer

Read the section that applies to your particular 10BT card.

Installing a Card in a PC, PC AT, or PC/XT

This section describes how to install the following 10BT adapter cards in a PC, PC AT, or PC/XT computer:

- NI5210-10BT
- NI6510-10BT

NI5210-10BT/NI6510-10BT

Before You Begin

Before you install an NI5210-10BT or NI6510-10BT in your PC:

- Make sure that the card is properly configured (see the appropriate section in Chapter 2).

- Record the card's configuration settings.

Restrictions

The following restrictions must be considered before installing the card.

- On the IBM PC AT, the NI5210-10BT operates correctly in any full-size slot. It is recommended that you use slots 1 or 7, if available, since these slots are designed specifically for devices such as the NI5210-10BT.

- The NI6510-10BT uses one **16-bit** expansion slot in an IBM PC AT (see Figure 3-1).

Installing the Card

To install an NI5210-10BT or NI6510-10BT in your PC, PC AT, or PC/XT, follow these steps:

1. Park your PC's hard disk, if it has one.
2. Turn your PC **off**.
3. Disconnect the power cord from the computer.
4. Remove the computer's cover by following these steps:
    a. Remove the five screws located on the back of the computer case.
    b. Wrap your fingers around the rear corners of the lid.
    c. Slide the lid off of the case to expose the expansion slots.
5. Select the expansion slot you are going to use.
6. Remove the expansion slot cover from the expansion slot you have selected, as shown in Figure 3-1. Save the screw and the expansion slot cover.

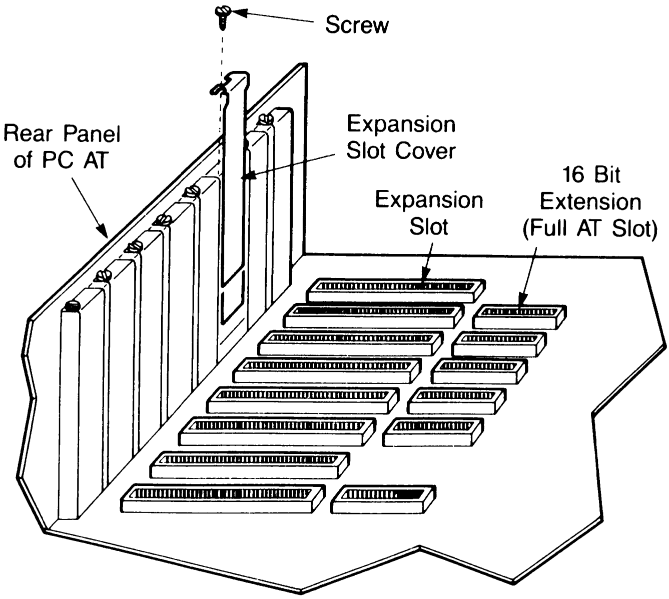


Figure 3-1. Removing an Expansion Slot Cover

7. Place the NI5210-10BT or NI6510-10BT in its expansion slot, as shown in Figure 3-2. Push the card down until the card's fingers snap into the slot.

Note: *Never force a card into an expansion slot or you will damage it. If you meet a great deal of resistance, remove the card and try again. When you lift the card gently and it resists and stays in place, it is properly connected.*

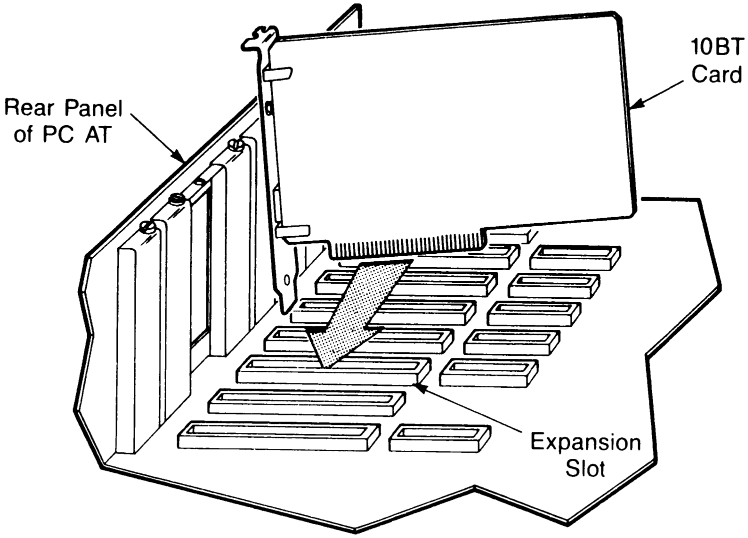


Figure 3-2. Placing the PC, PC AT, or PC/XT Card in an Expansion Slot

8. Align the mounting bracket so that you can replace the screw you removed in Step 2. Replace the screw.

This completes the installation procedure. To connect the PC, PC AT, or PC/XT card to your network, go to Chapter 4.

Installing a Card in a PS/2

This section describes installing an NI9210-10BT in a PS/2 computer.

NI9210-10BT

This section explains how to install the card in one of your PS/2's expansion slots. It contains information on the following procedures:

- Removing your PS/2's cover
- Installing the card in an expansion slot

Before You Begin

Before installing the card, make sure you have a copy of the *IBM Personal System/2 Model Quick Reference* for your PS/2 model. It contains important installation information you will need, such as the procedure for opening the PS/2's cover and which expansion slots are intended for 16-bit expansion cards.

Note: *Cards for PS/2 computers must be configured* **after** *installation. Refer to the "PS/2 Cards" section of Chapter 2 once you have completed the installation procedure for your PS/2 card.*

Removing Your PS/2's Cover

To gain access to your PS/2's expansion slots:

1. Park your PS/2's hard disk, if it has one.
2. Turn your PS/2 **off.**
3. Open your PS/2 to expose the expansion slots.

   Model 50. The PS/2 Model 50's cover is secured by a cover lock and two cover thumbscrews, both of which can be found on the rear of the unit. After unlocking the cover lock and loosening the cover thumbscrews, slide the cover towards the front of the unit and remove it. (Refer to the *Personal System/2 Model 50 Quick Reference* for more information).

Model 60 and 80. Because PS/2 Models 60 and 80 are desk-side models, their covers are on the side and open in a slightly different manner from the Model 50's. After unlocking the cover lock, loosen the two cover screws with a coin (these screws do not remove from the unit). Grasp the cover at a point just above the cover lock and pull the top of the cover towards you until it is approximately five inches away from the main unit. Then grasp both sides of the cover and remove it by pulling upwards. (Refer to the *Quick Reference* for your PS/2 model for more information.)

Installing the Card in an Expansion Slot

After you have removed your PS/2's cover, follow the steps listed below to install the card.

The installation procedure shown below uses the Model 50 as a sample case to demonstrate the common installation steps.

1. Locate the Model 50's expansion slots and choose one of the free **16-bit** slots. If all of these slots are occupied, the card can be installed in the Extended Video Adapter slot.

2. Align the card with the guides on both sides of the expansion slot, and slide the card into the slot until it clicks into place. Tighten the slot's thumbscrew.

Note: *Never force a card into an expansion slot or you will damage it. If you meet a great deal of resistance, remove the card and try again. When you lift the card* *gently and it resists and stays in place, it is properly connected.*

3. Reconnect any peripherals, cables, etc., and close the PS/2's case.

Now that your 10BT card is installed in your PS/2, it must be configured. Refer to the "PS/2 Cards" section of Chapter 2.

Installing a Card in a Macintosh II

This section describes installing a MacConnect 10BT in a Macintosh II computer.

MacConnect 10BT

To install the MacConnect 10BT in a Macintosh II computer, you need a small Phillips-head screwdriver. Follow these steps:

1. Make sure the Macintosh II's power is **turned off.**

   Note: *If the power has been on, wait at least five minutes before continuing; the computer's power supply case is hot.*

2. Disconnect the power cable from the computer.

3. Remove the computer's lid:

   a. Remove the security screw of the computer's rear panel with a Phillips-head screwdriver (see Figure 3-3).

   b. Lift up the lid, pressing the latches on the rear corners of the case to release it.

c. Put the lid aside.

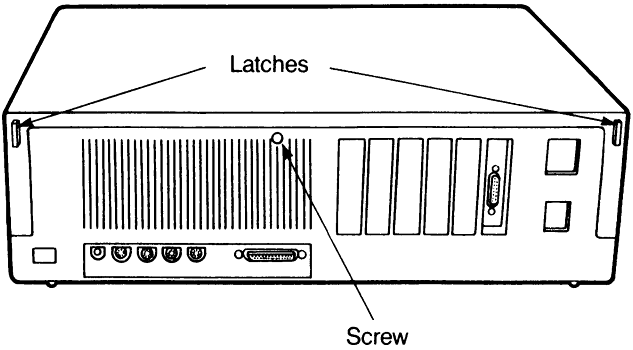


Figure 3-3. Removing the Macintosh II's Lid

4. Discharge any static electricity that may have accumulated on your clothes by touching the metal part of the computer's power supply case.

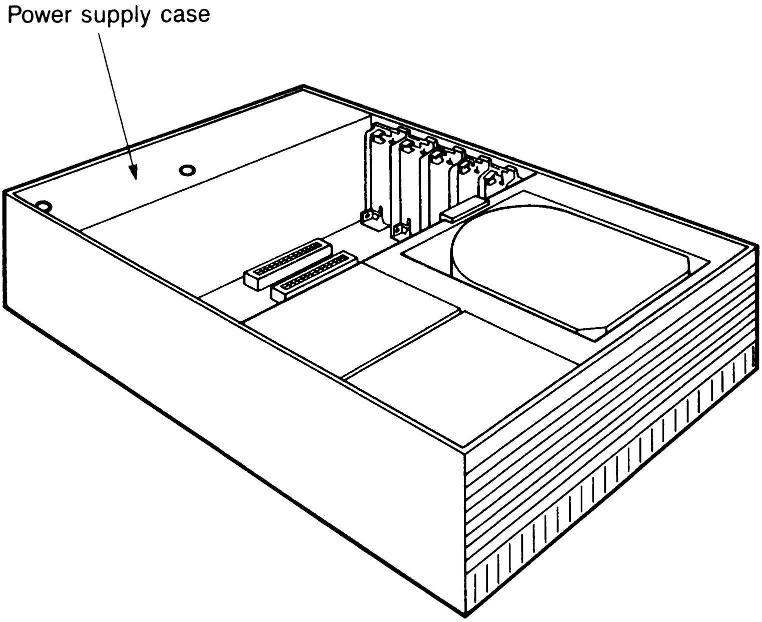


Figure 3-4. Location of the Power Supply Case

5. Select an available expansion slot. Remove the cover shield, which is directly behind the slot, by lifting it up, as shown in Figure 3-5.

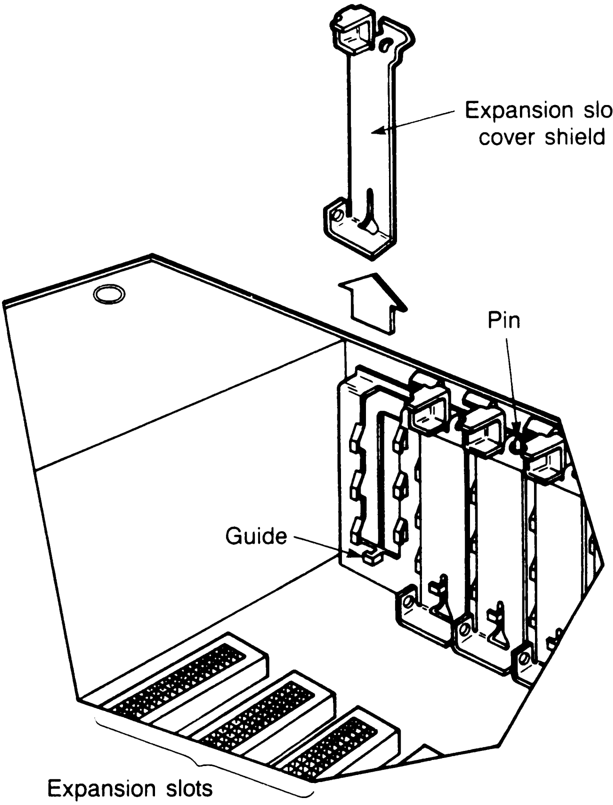


Figure 3-5. Removing the Expansion Slot Cover Shield

6. Find the hole cover of the expansion slot you are using. Push out the cover from the inside of the computer and put it aside, as shown in Figure 3-6.

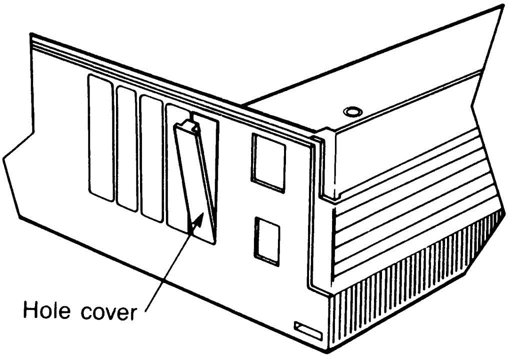


Figure 3-6. Removing the Expansion Slot Hole Cover

7. Insert the card into the expansion slot:

   a. Lift the card by its top edges.

      Note: *Do not touch the components of the card or the gold pins on the bottom edge of the card.*

   b. Line up the card so that the guide fits through the lower hole on the back of the card and the pin fits through the top hole, as shown in Figure 3-7.

   c. Line up the connector at the bottom of the card so that it is directly over the expansion slot.

   d. Place your hand on the top of the card and push down until it is seated. If you lift up gently on the card and it stays in place, it is properly connected.

Caution: *Do not force the card into the expansion slot. Remove the card and try again if it does not go in easily.*

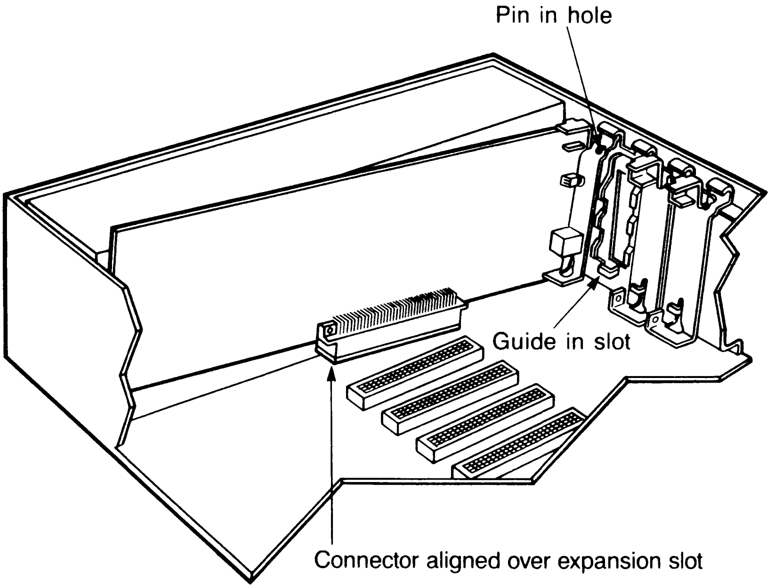


Figure 3-7. Placing the MacConnect 10BT in an Expansion Slot

8. Replace the computer's lid:

    a. Attach the front of the lid to the three latches inside the front of the computer's case. See Figure 3-8.

    b. Snap the back of the lid into place, and replace and tighten the security screw.

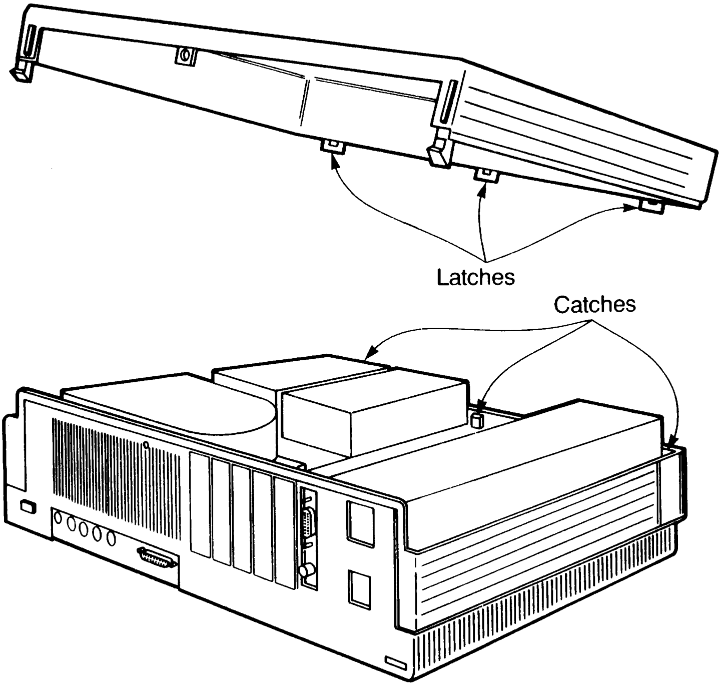


Figure 3-8. Replacing the Macintosh II's Lid

This completes the installation procedure. To connect the MacConnect 10BT to your network, go to Chapter 4.

Chapter 4

Connecting a Card to the Network

Before Connecting a Card to the Network

Connecting to an Unshielded Twisted Pair Network

Installing Network Software on the Macintosh II

CONNECTING A CARD TO THE NETWORK

This chapter contains information on:

- Connecting to a unshielded twisted pair network
- Installing network software for Macintosh II computers after connecting the card to the network

Before Connecting a Card to the Network

You must have the correct cables and other hardware to connect the card to your network.

Before connecting your 10BT card to a twisted pair network, make sure you have the following item:

- A unshielded twisted pair wire segment that is not more than 110 meters (360 ft) in length, with male RJ-45 connectors installed on both ends. This is the maximum allowable cable length from the card to the local concentrator, including patch cables.

The RJ-45 Connector and the Link/Receive LED

RJ-45 Connector

Each 10BT adapter card has an RJ-45 connector for connecting to an unshielded twisted pair network. The connector is linked to the card's built-in transceiver, eliminating the need for an external transceiver.

Link/Receive LED

Each 10BT adapter card has a green Link/Receive LED (visible through the card's mounting bracket) that provides information on the status of the card's network connection. If the LED is ON, it indicates a valid network connection. If the LED is flashing, it indicates that data is being received from the network.

Both the RJ-45 connector and Link/Receive LED are shown in Figure 4-1.

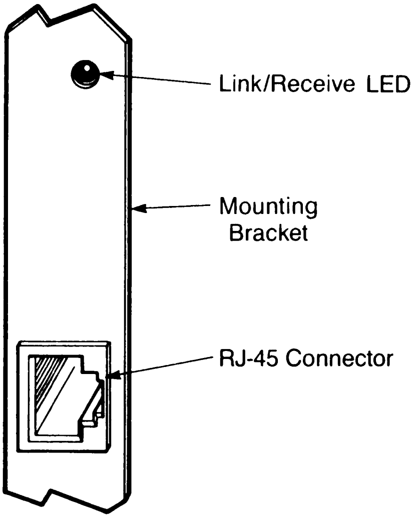


Figure 4-1. Locations of the RJ-45 Connector and Link/Receive LED

Connecting to an Unshielded Twisted Pair Network

To connect a card to an unshielded twisted pair network, follow these steps:

1. Insert the male RJ-45 connector at one end of your unshielded twisted pair wire segment to the female RJ-45 connector attached to the 10BT card's built-in transceiver, as shown in Figure 4-2.
2. Insert the male RJ-45 connector at the other end of the unshielded twisted pair wire segment into the network concentrator or unshielded twisted pair transceiver.

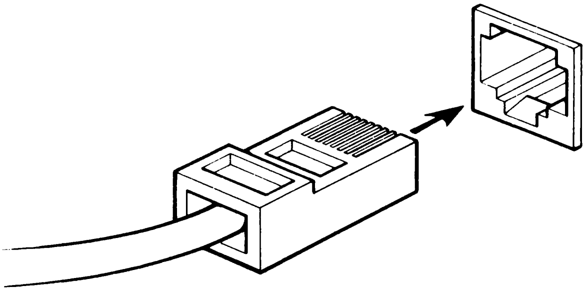


Figure 4-2. Connecting the Card to the Unshielded Twisted Pair Cable

Installing Network Software on the Macintosh II

Your MacConnect 10BT card comes with a MacConnect Installation Disk that contains:

- The MacConnect software
- The latest system files
- An install program

The MacConnect software must be installed in your computer for your Macintosh II to transmit and receive data on a twisted pair local area network.

Racal InterLan provides support for AppleTalk Phase 2 networks. If your network includes devices that have been upgraded to AppleTalk Phase 2, refer to the following Racal InterLan document before installing the MacConnect network software:

- *MacConnect Network Driver V. 2.0 Release Notes* (RN-MACNECT-DRV)

You should already have a system **startup disk** for your Macintosh II, containing system files that set the Macintosh II's internal components for correct operation when you start the computer. (This disk is either your computer's hard disk or a 3.5-inch disk.) The **MacConnect Installation Disk** enables you to update this startup disk with the MacConnect software.

Before You Begin

Before you begin installing the MacConnect 10BT software, make sure you have:

- Installed your card and connected it to the network, as described in Sections 2 and 3

- Made a backup copy of the MacConnect Installation Disk and put it in a safe place
- Made a startup disk on which to install the MacConnect software (usually, this will be your computer's hard disk)

Installing the MacConnect Software

To use the MacConnect software, your startup disk must contain the most recent system files and MacConnect software. You need to copy this information from your MacConnect Installation Disk to the disk you have selected to be your startup disk.

Installing the MacConnect Software on a Hard Disk

Follow these steps to install the MacConnect software on your computer's hard disk:

1. Turn off your Macintosh II and insert the MacConnect Installation Disk into your disk drive. Restart your Macintosh II.
2. Open the icon that represents the MacConnect Installation Disk.

   Note: *You can open an icon by double-clicking it or by selecting the Open from the File menu.*
3. Open the Installer icon.
4. Click the Drive button until you see the name of the computer's hard disk appear in the top right corner of the dialog box.
5. Click MacConnect to select it, as shown in Figure 4-3.

6. Click the Install button. The message "Installing on *Mac HD...*" appears in the dialog box.

7. When this procedure is complete, the message "Installation on *Mac HD* was successful" appears in the dialog box.

8. Click the Quit button to exit from the Installer program.

Installing the MacConnect Software on a 3.5-Inch Disk

Follow these steps to install the MacConnect software on a 3.5-inch startup disk:

1. Turn off your Macintosh II and insert the MacConnect Installation Disk into your disk drive. Restart your Macintosh II.

2. Open the icon that represents the MacConnect Installation Disk.

   Note: *You can open an icon by double-clicking it or by selecting the Open from the File menu.*

3. Open the Installer icon.

4. Click the Drive button until "MacConnect V*x*" appears in the top right corner of the dialog box.

5. Eject the MacConnect Installation Disk and insert the 3.5-inch startup disk. You now see the name of the 3.5-inch startup disk appear in the top right corner of the dialog box.

6. Click MacConnect to select it, as shown in Figure 4-3.

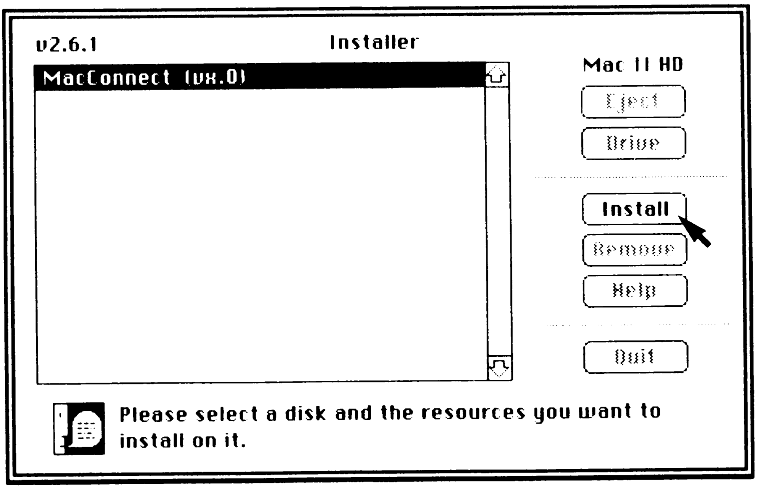
7. The message "figuring sizes" appears in the dialog box and the system prompts you to swap the two disks several times. When the this procedure is complete, the system returns you to the Installer.

8. Click the Install button.

9. The system again prompts you to swap the two disks several times. The message "Installing on *3.5-inch startup disk...*" appears in the dialog box.

10. When this procedure is complete, the message "Installation on *3.5-inch startup disk...* was successful" appears in the dialog box.

11. Click the Quit button to exit from the Installer program.



Please select a disk and the resources you want to install on it.

Figure 4-3. Installing the MacConnect Software

Now that the MacConnect software is installed on your startup disk, go to the section "Selecting MacConnect," to continue preparing your computer to use a twisted pair network.

Selecting MacConnect

When you start your Macintosh II, the AppleTalk Personal Network is automatically selected. The MacConnect startup disk you have made enables you to choose the type of network connection you want. To select the MacConnect software (and thereby the twisted pair local area network):

1. Select Control Panel from the Apple menu.

2. Open the Network icon for the network selection icons to appear, as shown in Figure 4-4. The Built-in icon corresponds to the AppleTalk Personal Network, while the MacConnect icon (shown in Figure 4-5) represents the twisted pair network.

3. Open the MacConnect icon to select your network connection.

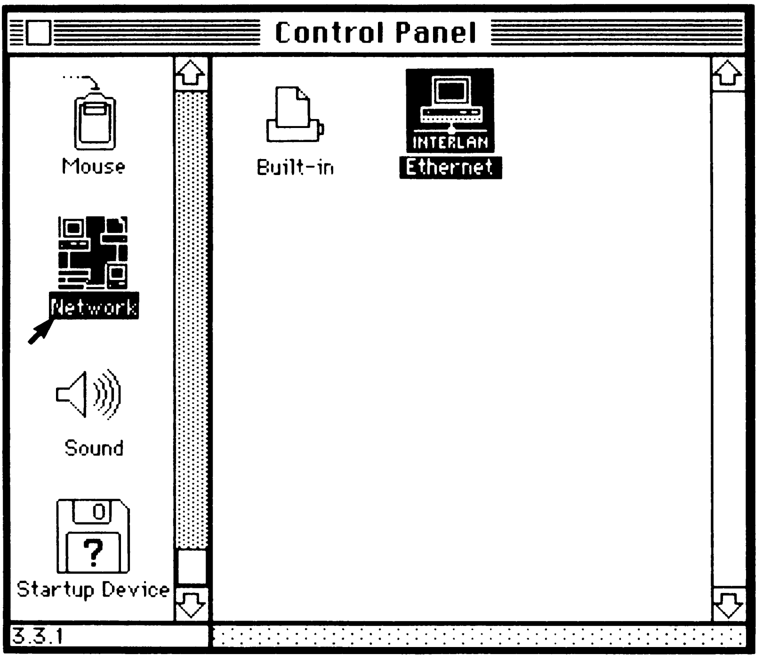


Figure 4-4. Selecting a Network Connection

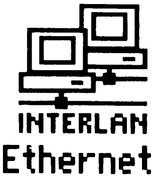


Figure 4-5. The MacConnect Icon

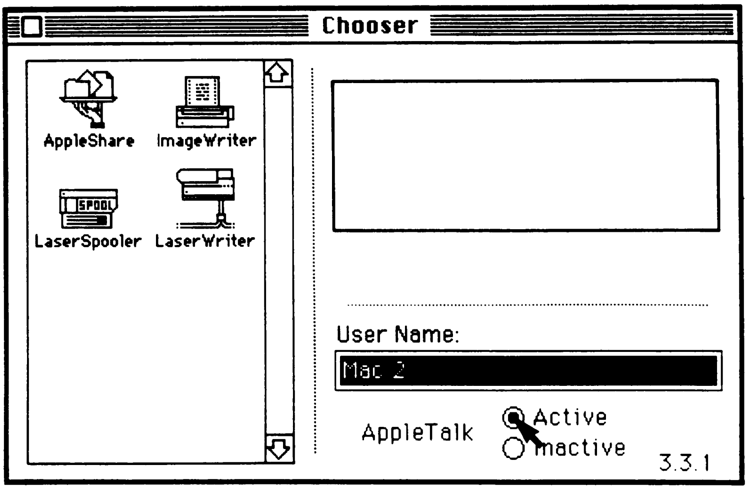
Activating AppleTalk

Even though the MacConnect interface card connects your Macintosh II to a twisted pair network rather than an AppleTalk Personal Network, MacConnect software still uses AppleTalk *protocols*, or rules for exchanging information over the network. These protocols are built into every Macintosh II computer.

For the MacConnect card to exchange information between your computer and other devices on the twisted pair network, AppleTalk must be active. To determine whether AppleTalk's status is active or inactive:

1. Select Chooser from the Apple menu.
2. Determine whether the Active or Inactive command button has been selected. A shaded circle appears inside the command button that is currently selected, as shown in Figure 4-6.
3. Click the Active button unless it is already selected.

   Note: *If your Macintosh II was previously part of an AppleTalk Personal Network, AppleTalk could already be activated.*



User Name: Mac 2

AppleTalk ● Active ○ Inactive

Figure 4-6. Activating AppleTalk

Using the MacConnect Startup Disk

If you have updated the startup disk on your computer's hard disk, follow these steps:

1. Select the Chooser from the Apple menu after you start your Macintosh II.

2. Select either the Built-in icon for the AppleTalk Personal Network or the MacConnect icon for the twisted pair network. (You must select one of these icons every time you start your Macintosh II.)

   Note: *If you are using an updated or new 3.5-inch startup disk, you must use this disk every time you start your Macintosh II. Otherwise, the computer automatically selects the built-in AppleTalk Personal Network. If this happens, insert the new or updated 3.5-inch disk and repeat the procedure described in the "Selecting MacConnect" section.*

Removing the MacConnect Software

You can use the install program on your MacConnect Installation Disk to remove the MacConnect software from your startup disk. If you need to remove the software:

1. Turn off your Macintosh II and insert the MacConnect Installation Disk. Restart your Macintosh II.
2. Open the Utilities folder.

   Note: *You can open an icon by double-clicking it or by selecting Open from the File menu.*

3. Open the Installer icon to start the installation procedure.
4. Click the Drive button until the startup disk containing the MacConnect software appears. (If you are using a 3.5-inch startup disk and have not inserted it into the disk drive, do so now.)
5. Click the MacConnect icon.
6. Click the Remove button to remove the MacConnect software from the startup disk.
7. Click the Quit button to exit from the install program.
8. Restart your Macintosh II with the startup disk.

Chapter 5

Verifying Configuration and Installation

Customer Diagnostics for PC, PC AT, PC/XT, and PS/2 Computers

Diagnostic Diskette Error Messages

Troubleshooting for the Macintosh II

VERIFYING CONFIGURATION AND INSTALLATION

This chapter describes testing the 10BT adapter card to make sure it is configured and installed correctly.

- Cards for PC, PC AT, PC/XT, and PS/2 computers are shipped with a Customer Diagnostic Diskette containing a diagnostic routine to test the card.
- Cards for Macintosh II computers have no Customer Diagnostic Diskette, but run a self-test program each time the computer is started.

This section is divided into three sections describing:

- How to use the Customer Diagnostic Diskette with PC, PC AT, PC/XT, and PS/2 computers
- How to interpret diagnostic error messages on PC, PC AT, PC/XT, or PS/2 computers
- How to interpret system error messages on a Macintosh II computer

Customer Diagnostics for PC, PC AT, PC/XT, and PS/2 Computers

This section describes the Customer Diagnostic program provided with 10BT cards for PC, PC AT, PC/XT, and PS/2 computers. It contains information on:

- Using the Customer Diagnostic Diskette
- Copying the diagnostic files to your computer's hard disk
- The diagnostic Main menu
- The areas of the diagnostic Main menu
- Changing parameters to test your card
- Running the diagnostic program
- Interpreting the diagnostic error messages

The Diagnostic Diskette

The diagnostic program is contained on the diskette provided with the 10BT adapter card. You run the diagnostic program after installing the card, and subsequently if you suspect a problem with the card or the network.

- A 5 1/4-inch diagnostic diskette is provided with PC, PC AT, and PC/XT 10BT cards.
- A 3 1/2-inch diagnostic diskette is provided with PS/2 10BT cards.

Copying the Diagnostic Program

Prior to running the diagnostics, you have the option of copying the diagnostic program onto your PC's hard disk, using the following steps. This allows you to run the diagnostics in the future without having to change drives and use the diskette.

1. Insert the diagnostic diskette into an available PC drive.
2. Copy the three files from the Diagnostic diskette to a directory within your DOS path, as follows:
   - *.EXE (the executable diagnostic file)
   - *.HLP (the diagnostic help file)
   - *.FMT (the format file with diagnostic and card settings)

   Note: *On the NI6510-10BT, the *.FMT file is included in the *.EXE file.*

NI5210-10BT and NI9210-10BT

This section describes using the diagnostic diskette provided with the NI5210-10BT and NI9210-10BT adapter cards.

Calling the Diagnostic Main Menu

- To view the diagnostic Main menu for the NI5210-10BT adapter card, at the DOS prompt type:

  NI5210DG <Enter>

The diagnostic Main menu should appear on your screen. If it does not, check that the diagnostic files are in your DOS path.

- To view the diagnostic Main menu for the NI9210-10BT adapter card, at the DOS prompt type:

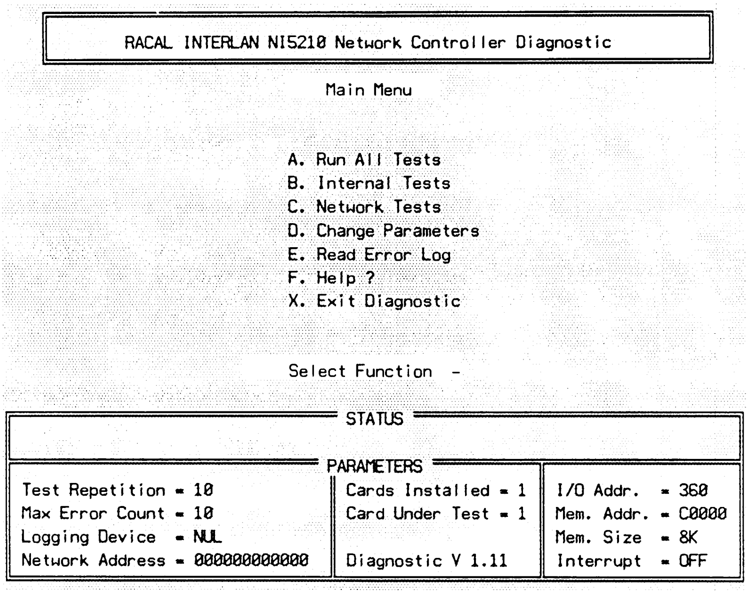
  NI9210DG <Enter>

The diagnostic Main menu should appear on your screen. If it does not, check that the diagnostic files are in your DOS path.

The Sections of the Diagnostic Main Menu

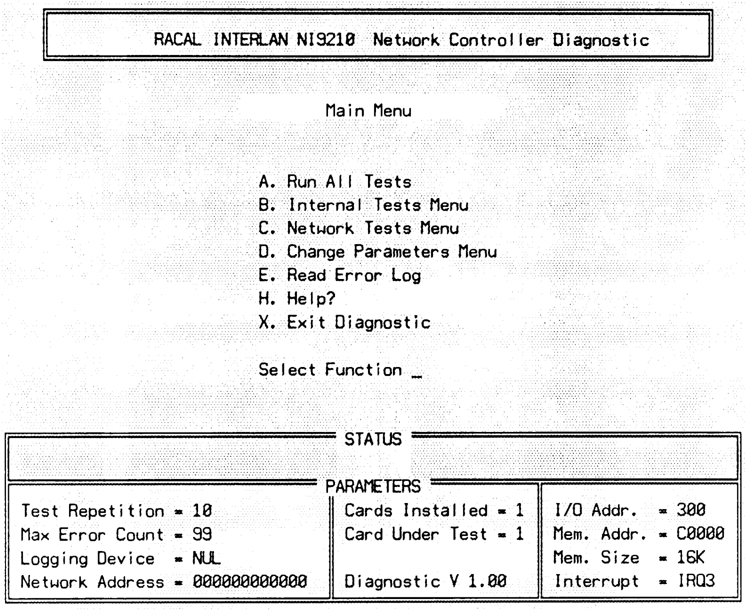
The diagnostic Main menus, shown in Figures 5-1 and 5-2, have three sections:

- Select Function
- Status
- Parameters



```
        RACAL INTERLAN NI5210 Network Controller Diagnostic

                              Main Menu


                         A. Run All Tests
                         B. Internal Tests
                         C. Network Tests
                         D. Change Parameters
                         E. Read Error Log
                         F. Help ?
                         X. Exit Diagnostic


                         Select Function  -

                                STATUS

                              PARAMETERS
 Test Repetition = 10            Cards Installed = 1   I/O Addr.   = 360
 Max Error Count = 10            Card Under Test = 1   Mem. Addr.  = C0000
 Logging Device  = NUL                                 Mem. Size   = 8K
 Network Address = 000000000000  Diagnostic V 1.11     Interrupt   = OFF
```

Figure 5-1. The Diagnostic Main Menu for the NI5210-10BT



```
        RACAL INTERLAN NI9210  Network Controller Diagnostic

                              Main Menu

                        A. Run All Tests
                        B. Internal Tests Menu
                        C. Network Tests Menu
                        D. Change Parameters Menu
                        E. Read Error Log
                        H. Help?
                        X. Exit Diagnostic

                        Select Function _

                               STATUS

                             PARAMETERS
Test Repetition = 10           Cards Installed = 1   I/O Addr.   = 300
Max Error Count = 99           Card Under Test = 1   Mem. Addr.  = C0000
Logging Device  = NUL                                Mem. Size   = 16K
Network Address = 000000000000 Diagnostic V 1.00     Interrupt   = IRQ3
```

Figure 5-2. The Diagnostic Main Menu for the NI9210-10BT

Select Function — The top part of the Diagnostic Main menu contains a list of user-selectable functions to enable running tests, getting help, changing parameters, and exiting the Diagnostic program. These functions are explained in the sections that follow.

Status — This area of the Main menu displays general error messages you receive after running the Diagnostic program. The Status area appears in each submenu selected from the Main menu.

Parameters — This area of the Main menu shows the card's default configuration, test repetition and error counts, network address, and the number of cards installed and being tested.

Note: *Before running any diagnostic tests, the Interrupt Level and Logging Device parameters need to be specified for the NI5210-10BT, and the Logging Device parameter needs to be specified for the NI9210-10BT (see "Parameters You Must Specify").*

The card's network address is specified after running diagnostics. The Parameters area appears in each submenu selected from the Main menu.

Changing Parameters

Default Parameter Settings

Unless you have changed the configuration of the following parameters before installing your 10BT card, they will match the settings listed in the Parameters section of the Main menu.

- I/O address (I/O base address)
- Memory address (memory base address)
- Memory size

Parameters You Must Specify

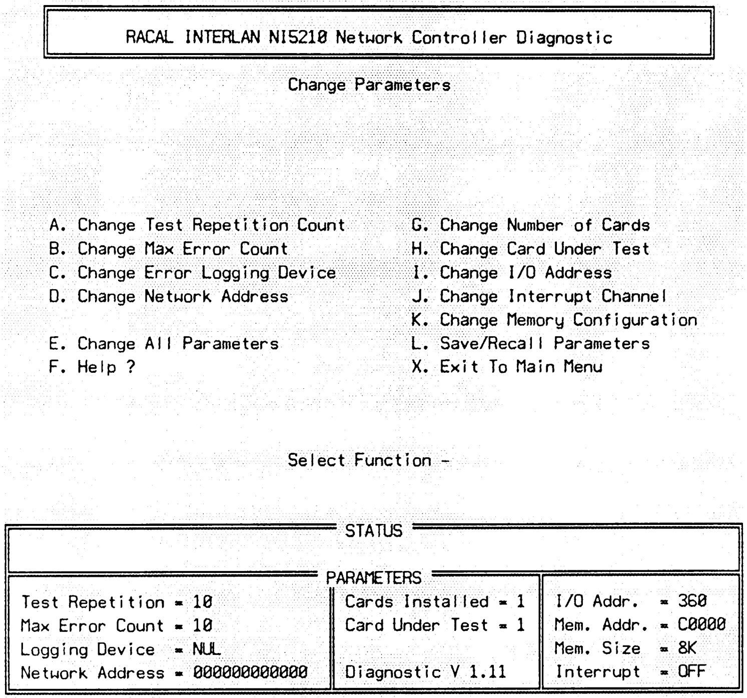
Before running any diagnostic tests for the NI5210-10BT, you must specify the following parameters:

- Logging Device
- Interrupt (Interrupt Request Level)

Before running any diagnostic tests for the NI9210-10BT, you must specify the following parameter:

- Logging Device

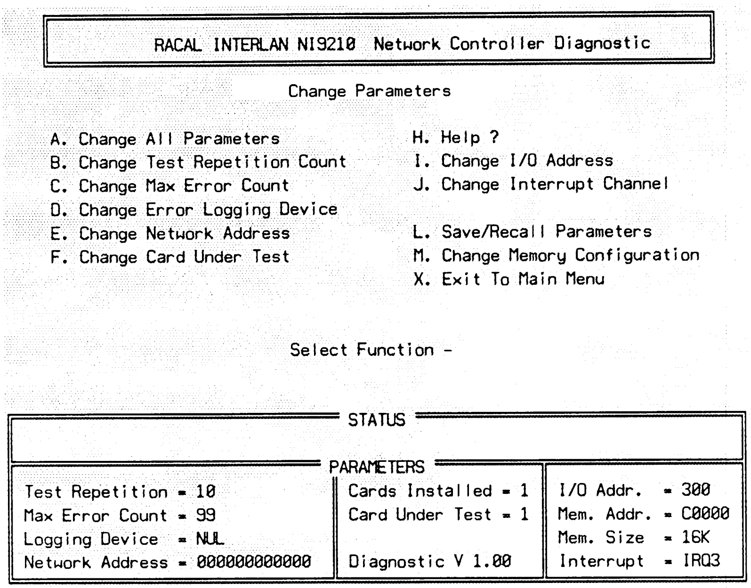
To specify these parameters, select **Change Parameters Menu** from the Diagnostic Main menu. The Change Parameters menu for your card type appears on your screen, as shown in Figures 5-3 and 5-4. As you specify parameters, they are added to the Parameters area of the menu.



```
            RACAL INTERLAN NI5210 Network Controller Diagnostic

                          Change Parameters


A. Change Test Repetition Count      G. Change Number of Cards
B. Change Max Error Count            H. Change Card Under Test
C. Change Error Logging Device       I. Change I/O Address
D. Change Network Address            J. Change Interrupt Channel
                                     K. Change Memory Configuration
E. Change All Parameters             L. Save/Recall Parameters
F. Help ?                            X. Exit To Main Menu


                          Select Function -

                                STATUS

                              PARAMETERS
Test Repetition = 10              Cards Installed = 1   I/O Addr.   = 360
Max Error Count = 10              Card Under Test = 1   Mem. Addr.  = C0000
Logging Device  = NUL                                   Mem. Size   = 8K
Network Address = 000000000000    Diagnostic V 1.11     Interrupt   = OFF
```

Figure 5-3. The Change Parameters Menu for the NI5210-10BT

The Change Parameters menu for the PS/2 10BT adapter card is shown in Figure 5-4.



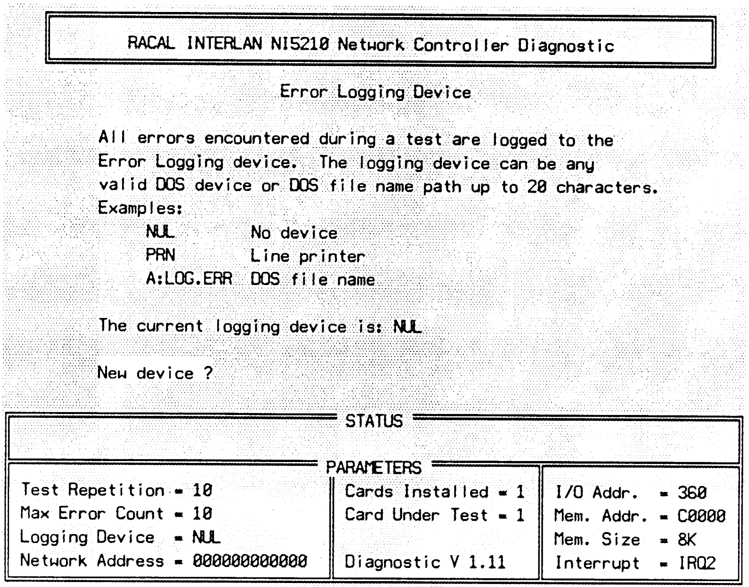
```
        RACAL INTERLAN NI9210  Network Controller Diagnostic

                          Change Parameters

A. Change All Parameters                 H. Help ?
B. Change Test Repetition Count          I. Change I/O Address
C. Change Max Error Count                J. Change Interrupt Channel
D. Change Error Logging Device
E. Change Network Address                L. Save/Recall Parameters
F. Change Card Under Test                M. Change Memory Configuration
                                         X. Exit To Main Menu


                          Select Function -

=============================== STATUS ================================

============================= PARAMETERS ==============================
Test Repetition = 10          | Cards Installed = 1 | I/O Addr.   = 300
Max Error Count = 99          | Card Under Test = 1 | Mem. Addr.  = C0000
Logging Device  = NUL         |                     | Mem. Size   = 16K
Network Address = 000000000000| Diagnostic V 1.00   | Interrupt   = IRQ3
```

Figure 5-4. The Change Parameters Menu for the NI9210-10BT

Note: *The diagnostic program for the NI5210-10BT and the diagnostic program for the NI9210-10BT are exactly the same. The remainder of this section uses NI5210-10BT diagnostic menus as examples.*

Logging Device — To receive specific diagnostic messages that may occur when you run the diagnostic tests, you need to specify a device or file name to which these errors will be written.

Select **Change Error Logging Device** from the Change Parameters menu. The Error Logging Device menu, shown in Figure 5-5, appears and prompts you to specify an error device or file name.



```
          RACAL INTERLAN NI5210 Network Controller Diagnostic

                         Error Logging Device

     All errors encountered during a test are logged to the
     Error Logging device.  The logging device can be any
     valid DOS device or DOS file name path up to 20 characters.
     Examples:
          NUL        No device
          PRN        Line printer
          A:LOG.ERR  DOS file name

     The current logging device is: NUL

     New device ?
================================ STATUS ================================

============================== PARAMETERS ==============================
 Test Repetition = 10          | Cards Installed = 1 | I/O Addr.  = 360
 Max Error Count = 10          | Card Under Test = 1 | Mem. Addr. = C0000
 Logging Device  = NUL         |                     | Mem. Size  = 8K
 Network Address = 000000000000| Diagnostic V 1.11   | Interrupt  = IRQ2
```

Figure 5-5. The Error Logging Device Menu

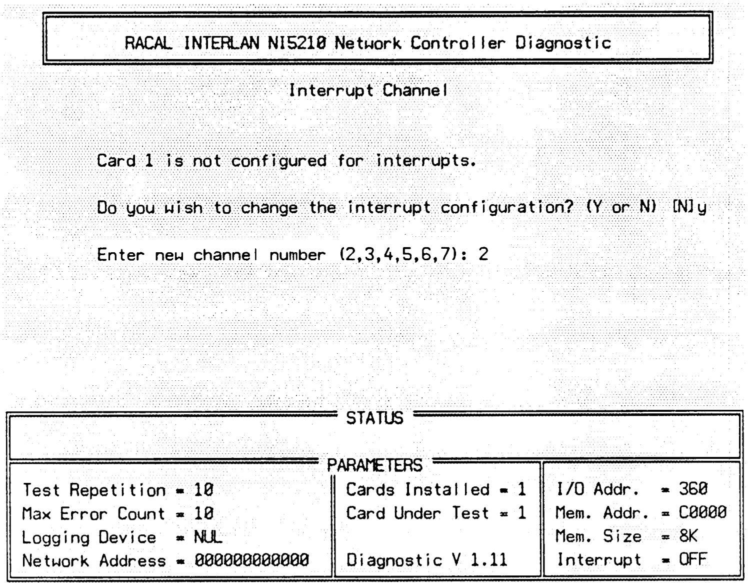
Enter either a device or file name, as follows:

- **PRN**, a device (such as a printer) through which the errors are output to you.

- **LOG.ERR**, a DOS file to which the errors are written. If you specify this file name, you can later display the file (eight lines at a time) by selecting **Read Error Log** from the diagnostic Main menu.

Interrupt — You specify the Interrupt Request level by selecting **Change Interrupt Channel.**

The Interrupt Channel menu, shown in Figure 5-6, appears and prompts you for an interrupt level.



```
RACAL INTERLAN NI5210 Network Controller Diagnostic

                Interrupt Channel


Card 1 is not configured for interrupts.

Do you wish to change the interrupt configuration? (Y or N) [N]y

Enter new channel number (2,3,4,5,6,7): 2



                        STATUS

                      PARAMETERS
Test Repetition = 10             Cards Installed = 1     I/O Addr.   = 360
Max Error Count = 10             Card Under Test = 1     Mem. Addr.  = C0000
Logging Device  = NUL                                    Mem. Size   = 8K
Network Address = 000000000000   Diagnostic V 1.11       Interrupt   = OFF
```

Figure 5-6. The Interrupt Channel Menu

Enter one of the following selections:

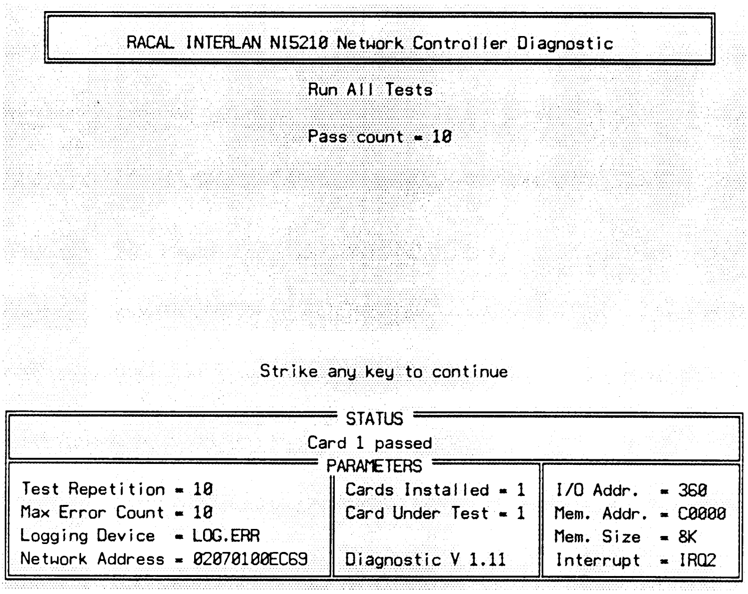
- **2** (the NI5210-10BT's default configuration)
- Another level number if you have changed the default level for the NI5210-10BT or NI9210-10BT

If you have changed any of the other parameters when installing the card, specify these new parameters by selecting the appropriate function from the Change Parameters menu (see Figure 5-3 or 5-4) and entering the new parameters. Save the new parameters by selecting **Save/Recall Parameters.**

If you have not changed any other parameters, you are ready to begin testing the card. Select **Exit to Main Menu** to return to the diagnostic Main menu.

Running Diagnostic Tests

To test the card, select **Run All Tests** from the diagnostic Main menu. The Run All Tests screen appears, as shown in Figure 5-7.



```
        RACAL INTERLAN NI5210 Network Controller Diagnostic

                          Run All Tests

                          Pass count = 10




                     Strike any key to continue

                               STATUS
                          Card 1 passed
                             PARAMETERS
Test Repetition = 10            Cards Installed = 1   I/O Addr.  = 360
Max Error Count = 10            Card Under Test = 1   Mem. Addr. = C0000
Logging Device  = LOG.ERR                             Mem. Size  = 8K
Network Address = 02070100EC69  Diagnostic V 1.11     Interrupt  = IRQ2
```

Figure 5-7. The Run All Tests Menu

If an error message appears in the Status area, review the contents of your error log device or file for specific error messages (see "Diagnostic Diskette Error Messages", later in the chapter).

You can further isolate the problem by selecting either **Internal Tests** or **Network Tests** from the diagnostic Main menu. These functions allow you to run tests on specific card components and functions.

NI6510-10BT

This section describes using the diagnostic diskette provided with the NI6510-10BT adapter card.

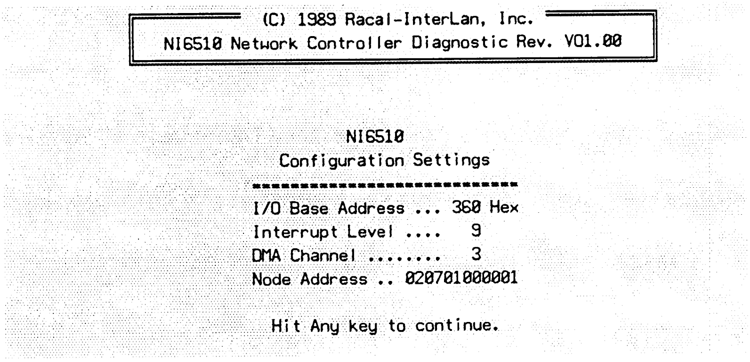
Calling the Diagnostic Main Menu

To view the diagnostic Main menu for the NI6510-10BT adapter card, at the DOS prompt type:

NI6510DG <Enter>

The NI6510-10BT Configuration Settings Table, which displays the configuration settings, appears (see Figure 5-8). If it does not, check that the diagnostic files are in your DOS path.

Note: *If you have a configuration conflict, a warning message appears. Press any key to get to the Main menu and exit from the diagnostics. You must correct the conflict directly on the card(s) involved. Refer to Chapter 2 for information on how to do this.*

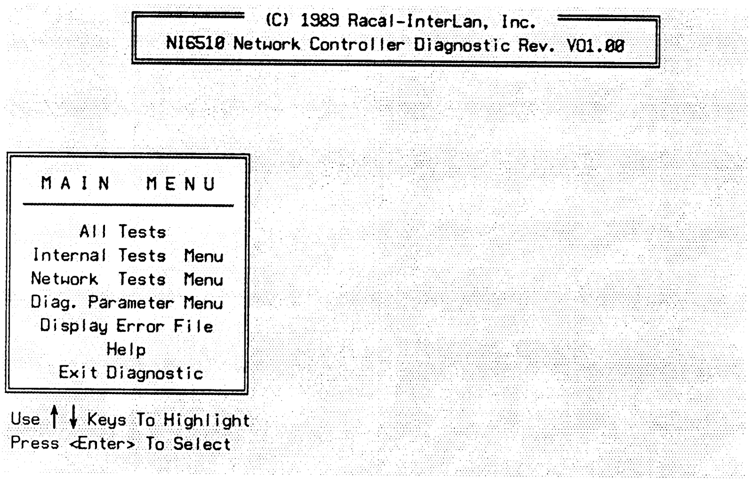


```
            (C) 1989 Racal-InterLan, Inc.
  NI6510 Network Controller Diagnostic Rev. V01.00


                     NI6510
             Configuration Settings
           ==============================
           I/O Base Address ... 360 Hex
           Interrupt Level ....   9
           DMA Channel ........   3
           Node Address .. 020701000001

             Hit Any key to continue.
```

Figure 5-8. The NI6510-10BT Configuration Settings Table

This table displays the configuration parameters read at startup. Check to make sure the values are correct.

Press any key to continue. The diagnostic Main menu appears (see Figure 5-9).



```
          (C) 1989 Racal-InterLan, Inc.
  NI6510 Network Controller Diagnostic Rev. V01.00

 M A I N   M E N U

      All Tests
 Internal Tests  Menu
 Network  Tests  Menu
 Diag. Parameter Menu
  Display Error File
         Help
    Exit Diagnostic

Use ↑ ↓ Keys To Highlight
Press <Enter> To Select
```

Figure 5-9. The Diagnostic Main Menu

The diagnostic Main menu allows you to:

- Run all tests
- Access other menus or help screens
- Display the error log file
- Exit the program

You can now run all tests. However, if you want to change logging devices or run tests over a long period of time, first go to the "Customizing the Diagnostics" section later in this chapter.

Running Diagnostic Tests

To test the card, select **Run All Tests** from the diagnostic Main menu. The Run All Tests screen appears.

If an error message appears in the Status area, review the contents of your error log device or file for specific error messages (see "Diagnostic Diskette Error Messages", later in this chapter).

You can further isolate the problem by selecting either **Internal Tests** or **Network Tests** from the diagnostic Main menu. These functions allow you to run tests on specific card components and functions.

Note: *Run network tests only after all internal tests have been run successfully.*

Running Tests Separately

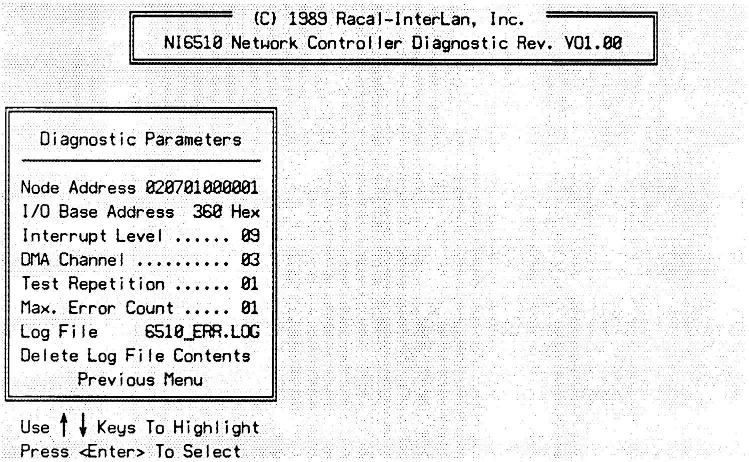
Follow these steps to run any internal or network test:

1. Use the ↑ or ↓ key to highlight the appropriate menu, either **Internal Tests Menu** or **Network Tests Menu**, and press Enter.
2. Use the ↑ or ↓ key to highlight the appropriate test. Press Enter and the test runs. Check the status window for pass or fail (error) messages. See "Diagnostic Diskette Error Messages" for messages information.

Changing Parameters

Follow these steps to customize the diagnostics:

1. Choose **Diagnostic Parameters Menu** from the Main menu with the ↑ or ↓ key and press Enter. The Diagnostic Parameters menu appears (see Figure 5-10).



```
(C) 1989 Racal-InterLan, Inc.
NI6510 Network Controller Diagnostic Rev. V01.00

Diagnostic Parameters

Node Address 020701000001
I/O Base Address  360 Hex
Interrupt Level ...... 09
DMA Channel .......... 03
Test Repetition ...... 01
Max. Error Count ..... 01
Log File     6510_ERR.LOG
Delete Log File Contents
      Previous Menu

Use ↑ ↓ Keys To Highlight
Press <Enter> To Select
```

Figure 5-10. The Diagnostic Parameters Menu

2. Use the ↑ or ↓ key to highlight any of the following three configurable parameters, and press Enter.

    - Log File, if you want to set up a different logging device

    - Test Repetition and Max. Error Count, if you want to run tests over a long period of time

3. Enter a new value at the prompt and press Enter. The new value automatically appears in the Diagnostic Parameters menu.

Note: *The diagnostic program automatically opens up a log file, 6510_ERR.LOG, in the directory that the NI6510-10BT diagnostic files are in.*

Diagnostic Diskette Error Messages

This section explains:

- How to interpret error messages generated by the Customer Diagnostic Diskette for PC, PC AT, PC/XT, and PS/2 computers

If a test cannot be run, or if a test fails, you receive an error message. These error messages are caused by the following problems:

- Incorrect parameter settings
- Hardware failures

NI5210-10BT and NI9210-10BT

A Test Cannot Be Run

If a particular test cannot be run, it is for one of the following reasons:

- The parameter settings on the card are not correct. Check your records for the correct parameter setting. If the parameter settings on the card are incorrect, remove the card and change the appropriate jumpers.

- The parameter settings on the card are correct, but they have not been specified accurately to the diagnostic program. Select the Change Parameters menu (**D** from the diagnostic Main menu) and specify the correct parameter settings. Return to the diagnostic Main menu and enter **A** to run all tests again.

The error messages appear in the Status area. The most common of these messages are listed and described below.

```
No Interrupt Line Selected.
```

You **must** enable an interrupt channel. Make sure that the IRQ setting on the card matches the interrupt value shown in the Parameters area.

```
No NI5210 at this I/O address.
```

The diagnostic program could not be run because it could not find your card at the address listed in the Parameters area of the diagnostic menu. If your card has the correct address, its slot in the PC may be defective. Either test the slot by installing another card or try the card in another slot.

A Test Fails

If any one of the diagnostic tests fail, the diagnostic program stops and displays the following message in the Status area:

```
Card 1 Failed.
```

If you receive this message, check the output from your logging device, or display the contents of your log file by selecting **Read Error Log** from the diagnostic Main menu. The error log file should contain one or more of the following messages. If you check your settings as suggested in the explanations and you still receive the message, or if the message indicates the problem is a hardware failure, see the Support Services section.

The rest of the messages that can be recorded in the error log follow:

```
Cannot write to extended memory.
```

The diagnostics were configured for 16 KB of RAM, but the second 8 KB of RAM could not be found. Check that your card's memory configuration jumpers are set correctly.

```
Data compare error nnnn.
```

After the loopback test, the receive buffer did not match the transmit buffer. This is a hardware failure. See the Support Services section.

```
Invalid network address.
```

The Ethernet address does not begin with the assigned Racal InterLan number (020701). Check to make sure that the setting of your I/O base address is correct.

```
Invalid ROM test pattern.
```

The test pattern for the read-only memory is incorrect. Check the setting of your I/O base address to make sure it is correct.

```
82586 command complete interrupt failure.
```

The 82586 failed to interrupt the PC upon completion of a command. Check your interrupt setting.

```
82586 failed to accept cmd command.
cmd command failed to complete.
cmd command failed.
```

The 82586 failed to execute the specified command correctly. This is generally caused by a hardware failure. See the Support Services section.

```
82586 failed to initialize.
```

The diagnostics could not communicate with the 82586, or there was a general failure of the 82586. Check your memory address (memory base address) setting.

```
82586 receiver start failure.
```

The diagnostics could not start 82586 packet reception. This is a hardware failure. See the Support Services section.

NI6510-10BT

This section lists all error messages. The errors are either user-correctable or hardware failures (not user correctable), and are grouped accordingly.

User-Correctable Errors

If you get a diagnostic error message in the status window, make a note of it. Check this section to see if it is a user-correctable error. If it is, reconfigure the necessary card(s) to correct the problem.

Note: *In the following messages,* xxxx *stands for variable data patterns that are not equal, and* (n) *is the phase number of the Internal Loopback Test.*

I/O Base Address-Related Errors

If you get any of the following messages, check your cards for an I/O base address conflict. Reconfigure the card(s) to correct the problem (see Chapter 2).

- WARNING: Possible I/O address conflict.
  Reset Failure: Status Found: *xxxx* Expected: *xxxx*
- WARNING: Possible I/O address conflict.
  Reg. 1 Data Failure: Found *xxxx* Expected *xxxx*
- WARNING: Possible I/O address conflict.
  Reg. 2 Data Failure: Found *xxxx* Expected *xxxx*
- WARNING: Possible I/O address conflict.
  NI6510 Node Address PROM Failure detected.
  I/O address *xxxx* Expected: *xx* Found: *xx*

IRQ Level and DMA Channel-Related Errors

If you get any of the following messages, check your cards for an IRQ level or DMA channel conflict. Reconfigure the card(s) to correct the problem (see Chapter 2).

- INITIALIZE Complete interrupt not detected.
  WARNING: Possible interrupt level conflict,
  or possible DMA channel conflict.
- Int Lpbk ph.(*n*) Initialize Done Interrupt not found.
  WARNING: Possible interrupt level conflict,
  or possible DMA channel conflict.
- Int Lpbk ph.(*n*) Xmit Packet interrupt not detected.
  WARNING: Possible interrupt level conflict,
  or possible DMA channel conflict.
- Int Lpbk ph.(*n*) Rcv Packet interrupt not detected.
  WARNING: Possible interrupt level conflict,
  or possible DMA channel conflict.
- Ext Lpbk Initialize done interrupt not found.
  WARNING: Possible interrupt level conflict,
  or possible DMA channel conflict.
- Ext Lpbk Xmit Packet interrupt not detected.
  WARNING: Possible interrupt level conflict,
  or possible DMA channel conflict. (See also the "Network Connection-Related Errors" section for this error.)
- Ext Lpbk Rcv Packet interrupt not detected.
  WARNING: Possible interrupt level conflict,
  or possible DMA channel conflict.
- Transmit Packet Test: Xmit interrupt not detected.
  WARNING: Possible interrupt level conflict,
  or possible DMA channel conflict. (See the "Network Connection-Related Errors" section.)

- Echo Test Error: Xmit interrupt not detected.
  WARNING: Possible interrupt level conflict,
  or possible DMA channel conflict.

Network Connection-Related Errors

If you get any of the following messages, check your network connection (see Chapter 4).

- Initialization Failure or Warning detected.
  WARNING: No Heartbeat detected.
  Check cable connection. (If your network is *not* configured with heartbeat, ignore this error).

- External Loopback Failure or Warning detected.
  WARNING: No Heartbeat detected.
  Check cable connection. (If your network is *not* configured with heartbeat, ignore this error).

- Ext Lpbk Transmitter error detected.
  Transmitter detected loss of carrier.
  Check network cable connection.

- Transmit Packet Test: Transmitter error detected.
  Transmitter detected loss of carrier.
  Check network cable connection.

- Echo Test Error: Transmitter error detected.
  Transmitter detected loss of carrier.
  Check network cable connection.

- Echo server Error: Transmitter error detected.
  Transmitter detected loss of carrier.
  Check cable connection.

- Ext Lpbk Xmit Packet interrupt not detected.
  WARNING: Possible interrupt level conflict,
  or possible DMA channel conflict.

- Transmit Packet Test: Xmit interrupt not detected.
  WARNING: Possible interrupt level conflict,
  or possible DMA channel conflict.

- Echo Test Error: No response from broadcast.
  Either the cable is not connected, or there is no echo server on the network.

- Echo Test Error: No response from server.
  Either the station running or executing the echo server became disconnected, or the execution of the echo server has been stopped.

Hardware Failure Error Messages

The following messages indicate a hardware failure that you *cannot* fix. If you get any of the following error messages, refer to the Support Services section at the end of this manual.

- Initialization Failure or Warning detected.
  Status Reg. Error: Transmitter timeout error.
  Transmitter on longer than maximum packet time.

- Initialization Failure or Warning detected.
  Status Reg. Error: Missed packet error detected.
  Receiver ran out of receive buffers.

- Initialization Failure or Warning detected.
  Status Reg. Error: Memory error detected.
  Did not receive READY signal within 25.6uSec.

- Internal Loopback failure detected.
  Status Reg. Error: Transmitter timeout error.
  Transmitter on longer than maximum packet time.

- Internal Loopback failure detected.
  Status Reg. Error: Missed packet error detected.
  Receiver ran out of receive buffers.

- Internal Loopback failure detected.
  Status Reg. Error: Memory error detected.
  Did not receive READY signal within 25.6uSec.
- Int Lpbk ph.(*n*) Transmitter error detected.
  Transmitter detected a buffer error.
- Int Lpbk ph.(*n*) Transmitter error detected.
  Transmitter detected an underflow error.
- Int Lpbk ph.(*n*) Transmitter error detected.
  Transmitter detected a late collision error.
- Int Lpbk ph.(*n*) Transmitter error detected.
  Transmitter detected loss of carrier.
- Int Lpbk ph.(*n*) Transmitter error detected.
  Transmitter detected a retry error.
- Int Lpbk ph.(*n*) Receiver error detected.
  Incoming packet contained a frame error.
- Int Lpbk ph.(*n*) Receiver error detected.
  Overflow error detected on incoming packet.
- Int Lpbk ph.(*n*) Receiver error detected.
  A CRC error detected on incoming packet.
- Int Lpbk ph.(*n*) Receiver error detected.
  A Receive Buffer allocation error detected.
- Int Lpbk ph.(*n*) Xmit-Rcv Pckt size mismatch error.
  The receive frame packet size did NOT match the size of the packet transmitted.
- Int Lpbk ph.(*n*) data mismatch. Xmit=*xx* Rcv=*xx*.
  The receive packet data field did NOT match the transmitted packet data field.

- Int Lpbk ph.(*n*) CRC error detected. NI6510 CRC=*xxxxxxxx* Calculated=*xxxxxxxx* The generated hardware CRC did NOT match the software calculated CRC.

- Int Lpbk 3 Error: Receiver interrupt detected. Phase 3 of the internal loopback test, the receive frame interrupt, should NOT occur.

- Int Lpbk 3 Error: TMD3 Retry error bit not set. Phase 3 of the internal loopback test, the Retry bit, should have been set.

- Int Lpbk 3 TMD1 error bit not set. Phase 3 of the internal loopback test, the Error bit, should have been set.

- External Loopback Failure or Warning detected. Status Reg. Error: Transmitter timeout error. Transmitter on longer than maximum packet time.

- External Loopback Failure or Warning detected. Status Reg. Error: Missed packet error detected. Receiver ran out of receive buffers.

- External Loopback Failure or Warning detected. Status Reg. Error: Memory error detected. Did not receive READY signal within 25.6uSec.

- Ext Lpbk Transmitter error detected. Transmitter detected a buffer error.

- Ext Lpbk Transmitter error detected. Transmitter detected an underflow error.

- Ext Lpbk Transmitter error detected. Transmitter detected a late collision error.

- Ext Lpbk Transmitter error detected. Transmitter detected a Retry error.

- Ext Lpbk Receiver error detected.
  Incoming packet contained a frame error.
- Ext Lpbk Receiver error detected.
  Overflow error detected on incoming packet.
- Ext Lpbk Receiver error detected.
  A CRC error detected on incoming packet.
- Ext Lpbk Receiver error detected.
  A Receive Buffer allocation error detected.
- Ext Lpbk Xmit-Rcv Pckt size mismatch error.
  The receive frame packet size did NOT match the size of the packet transmitted.
- Ext Lpbk data mismatch. Xmit=*xx* Rcv=*xx*. The receive packet data field did not match the transmitted packet data field.
- Transmit Packet Test: Transmitter error detected.
  Transmitter detected a buffer error.
- Transmit Packet Test: Transmitter error detected.
  Transmitter detected an underflow error.
- Transmit Packet Test: Transmitter error detected.
  Transmitter detected a late collision error.
- Transmit Packet Test: Transmitter error detected.
  Transmitter detected a Retry error.
- Receive Packet: Fatal Error detected.
  Incoming packet contained a frame error.
- Receive Packet: Fatal error detected.
  Overflow error detected on incoming packet.
- Receive Packet: Fatal error detected.
  A Receive Buffer allocation error detected.

- Echo Test Error: Transmitter error detected.
  Transmitter detected a buffer error.
- Echo Test Error: Transmitter error detected.
  Transmitter detected an underflow error.
- Echo Test Error: Transmitter error detected.
  Transmitter detected a late collision error.
- Echo Test Error: Transmitter error detected.
  Transmitter detected a Retry error.
- Echo Test Error: Receive error detected.
  Incoming packet contained a frame error.
- Echo Test Error: Receive error detected.
  Overflow error detected on incoming packet.
- Echo Test Error: Receive error detected.
  A CRC error detected on incoming packet.
- Echo Test Error: Receive error detected.
  A Receive Buffer allocation error detected.
- Echo Test data mismatch: Found *xx* Expected *xx*.
  The receive packet data field did NOT match the transmitted packet data field.
- Echo Server Error: Transmitter error detected.
  Transmitter detected a buffer error.
- Echo Server Error: Transmitter error detected.
  Transmitter detected an underflow error.
- Echo Server Error: Transmitter error detected.
  Transmitter detected a late collision error.
- Echo Server Error: Transmitter error detected.
  Transmitter detected a Retry error.

- Echo Server Error: Receiver error detected.
  Incoming packet contained a frame error.

- Echo Server Error: Receiver error detected.
  Overflow error detected on incoming packet.

- Echo Server Error: Receiver error detected.
  A CRC error detected on incoming packet.

- Echo Server Error: Receiver error detected.
  A Receive Buffer allocation error detected.

If you get the following message, you do *not* have a problem with your NI6510-10BT. This message indicates either a problem with your network, or with the card that sent the message.

- Receive Packet: Fatal Error detected.
  A CRC error detected on incoming packet.

Troubleshooting for the Macintosh II

This section explains how to troubleshoot problems and interpret system error messages on a Macintosh II computer with an installed MacConnect 10BT card. This section:

- Explains how to examine the network for problems in the cable connection

- Describes, and offers solutions to, problems you may encounter when using MacConnect 10BT in a Macintosh II

A problem can be particular to a device or service. Therefore, if the problem you are experiencing is not discussed here, refer to the user's manual for that device or service.

Network Problems and Solutions

When the problem is on the network, check the following:

- **Cables.** Check both ends of your network cable to be sure the connections are secure. You should also check the network cables of the service you are trying to use. Try replacing the cables with ones you know are working correctly.
- **Devices.** Check that a device has not been switched off or disconnected. If you are having trouble with a particular device or application, check the user's manual for that device or application. Also, make sure that your Macintosh II and the device you are trying to use are on the same network; follow the cable from one to the other. Make sure the device ID number is exclusive to the device you are using.
- **Card.** Shut down your Macintosh II and check to see that the MacConnect 10BT card is inserted securely in its expansion slot.

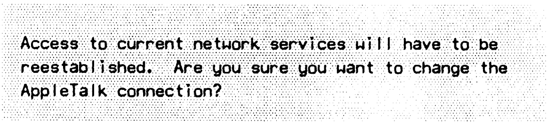
MacConnect 10BT Problems and Suggested Solutions

This section describes specific instances of problems you may experience when using MacConnect 10BT, and their possible solutions.

Note: *Before selecting a new network connection in the Control Panel, you must close and reopen the Chooser, in order to view the updated list of services on the network you are selecting.*

If You Cannot Access Network Services

When you change your network connection from the AppleTalk Personal Network to the twisted pair network, you receive the following message:

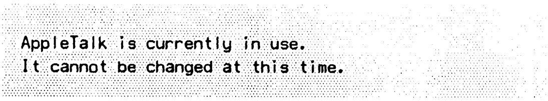


```
Access to current network services will have to be
reestablished.  Are you sure you want to change the
AppleTalk connection?
```

This means that all current *inactive* network services are disconnected when you select a different network connection in the Control Panel. To reestablish these services after switching your network connection, you must restart your Macintosh II.

If You Cannot Switch Network Connections

If you have an *active* service or application in use on your Macintosh II, you cannot change your network connection in the Control Panel. You will see the following message:



```
AppleTalk is currently in use.
It cannot be changed at this time.
```

Find out what services or applications your Macintosh II is using and quit these services or applications with the Shut Down command. You must use the Shut Down command unless the Macintosh II is a server. In that case, follow the shutdown instructions in the server administrator's guide.

Restart your Macintosh II, using the MacConnect Installation Disk.

Missing Network Services

If no service is accessible from the network, you are experiencing one of the following problems:

- A bad connection between your network cable and the MacConnect 10BT card installed in your Macintosh II.

- 254 devices are already active on the network. See your system administrator to determine the number of active devices and try again.

There may also be a problem with the service you are trying to access, such as a malfunction, a disconnection from the network, or the service could simply be turned off. The problem could also be in the network cables.

Missing Network Icon

If the Control Panel does not contain the Network icon, you are experiencing one of the following problems:

- The current startup disk does not contain the MacConnect software. Refer to Chapter 4.

- The System Folder does not contain the Network icon. Find it and return it to the System Folder, then restart your Macintosh II.

- The startup disk is not Version 3.1 or greater. Check the lower left corner of the Control Panel to verify the version number.

Missing MacConnect Icon

If the MacConnect icon does not appear after you select the Network icon, you are experiencing one of the following problems:

- The current startup disk does not contain the MacConnect software. Refer to Chapter 4.

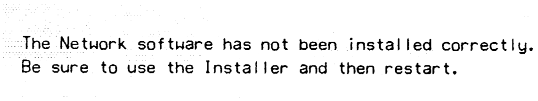
- The System Folder does not contain the MacConnect icon. Find it and return it to the System Folder, then restart your Macintosh II.

- Either your MacConnect 10BT card is not working correctly, or you do not have the card installed in your Macintosh II. Follow the instructions in Chapter 3.

If You Cannot Select the Network or MacConnect Icons

Network icon

If the MacConnect software was improperly installed on the most recent startup disk used in your Macintosh II, you will receive the following message when you select the Network icon:

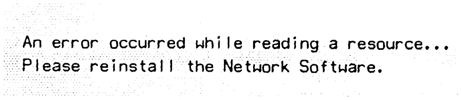


```
The Network software has not been installed correctly.
Be sure to use the Installer and then restart.
```

Dragging the Network icon from the MacConnect Installation Disk to the startup disk's System Folder will not work. To solve this problem, you must reinstall the MacConnect software using the install program on the MacConnect Installation Disk. Refer to Chapter 4.

MacConnect icon

If you did not start your Macintosh II with a MacConnect startup disk, or if the startup disk has been damaged, you receive the following message:

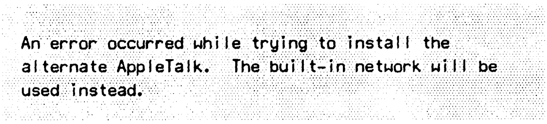


```
An error occurred while reading a resource...
Please reinstall the Network Software.
```

Part of the MacConnect software is unreadable on the current startup disk, and the system file could be damaged. Try removing and reinstalling the MacConnect software, or restart your Macintosh II with a new MacConnect startup disk. Refer to Chapter 4.

If MacConnect 10BT Is Missing on Startup

If MacConnect is missing when you start your Macintosh II, you receive the following message:



```
An error occurred while trying to install the
alternate AppleTalk.  The built-in network will be
used instead.
```

This means that your Macintosh II had a problem integrating the MacConnect software into its memory. In this case, Macintosh II defaults to the AppleTalk Personal Network. The following situations cause this problem:

- Your System Folder does not contain the MacConnect icon. Find it and return it to the System Folder, then restart your Macintosh II.

  Note: *If you are unable to find the MacConnect icon, you will have to reinstall the software, using the steps outlined in Chapter 4.*

- Either you do not have a MacConnect 10BT card installed in your Macintosh II, or the card is malfunctioning. Refer to Chapter 3.

- The MacConnect software was not installed properly, or the System file has been damaged.

Although your Macintosh II found the Network icon in the System Folder at startup, it did not find the rest of the MacConnect software. As a result, the Control Panel could not recognize the network connection options. Reinstall the MacConnect software following the steps in Chapter 4, or try another MacConnect startup disk.

After you correct the problem, you must reselect MacConnect; otherwise the Macintosh II defaults to the AppleTalk Personal Network. Refer to Chapter 4.

If the Chooser or Control Panel Is Missing

Unless they have been moved with the Apple Application Program Font/DA Mover, the Chooser and Control Panel are on all MacConnect startup disks that contain Version 3.3 or greater system files. Startup disks with system files earlier than 3.3 may not have the Chooser or Control Panel.

Therefore, when you use more than one startup disk (for example, your hard disk and a 3.5-inch disk), you may have an older disk that has not been updated with the current system files and does not have the Chooser or the Control Panel installed. If your Macintosh II switches to that disk, the Chooser or Control Panel will be missing.

To make sure that the Chooser and the Control Panel are installed correctly, use the Installer program from the MacConnect Installation Disk to update all of your startup disks. Refer to Chapter 4.

Chooser Not Installed Properly

If you did not use the Installer program to put the Chooser on the startup disk, you will get a message saying the Chooser is not installed properly. Reinstall the MacConnect software. Refer to Chapter 4.

Note: *Do not use the Font/DA Mover to put the Chooser on the startup disk.*

Macintosh Will Not Respond

If you are not properly connected to the network, you will not be able to access any network services and your Macintosh II will hang briefly. Refer to "Network Problems and Solutions," earlier in this chapter, for more information.

SUPPORT SERVICES

This section explains how to get customer support and how to get information about Racal InterLan Service Programs.

If You Purchased from a Reseller

You must contact the reseller or distributor who sold you your Racal InterLan product(s) in any of these instances:

- You received damaged product(s).
- You received the wrong product(s).
- You need ordering, servicing, or any technical assistance.

If You Purchased Directly from Racal InterLan

If you purchased product(s) directly from Racal InterLan, and you are experiencing any of the problems listed above, call Racal InterLan. In the United States, use this number:

1-800-LAN-TALK

If you are calling from anywhere outside the United States, you must first obtain your country code for the United States from your International Operator, then use it with this number:

1-(*code*)-508-263-9929 ext. 323

Racal InterLan Service Programs

You may purchase any of Racal InterLan's service programs, regardless of who sold you your product(s). For information about these programs, write to Racal InterLan at this address:

Racal InterLan, Inc.
155 Swanson Road
Boxborough, MA 01719
Attn. Customer Support Administrator

Comments and Suggestions

If you have any comments or suggestions, contact Racal InterLan at this *uucp* mail address:

uunet!interlan!engsup

Or, you can use the *darpa* internet address:

engsup@interlan.interlan.com

Note: *These two addresses are for comments and suggestions only; they are* **not** *for the purpose of obtaining technical assistance.*

950-1279-00 AA

Racal InterLan, 155 Swanson Rd., Boxborough, MA 01719